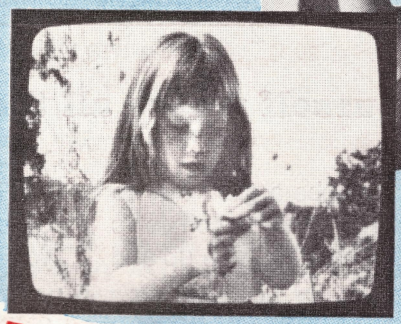
THIRTY-FIVE CENTS

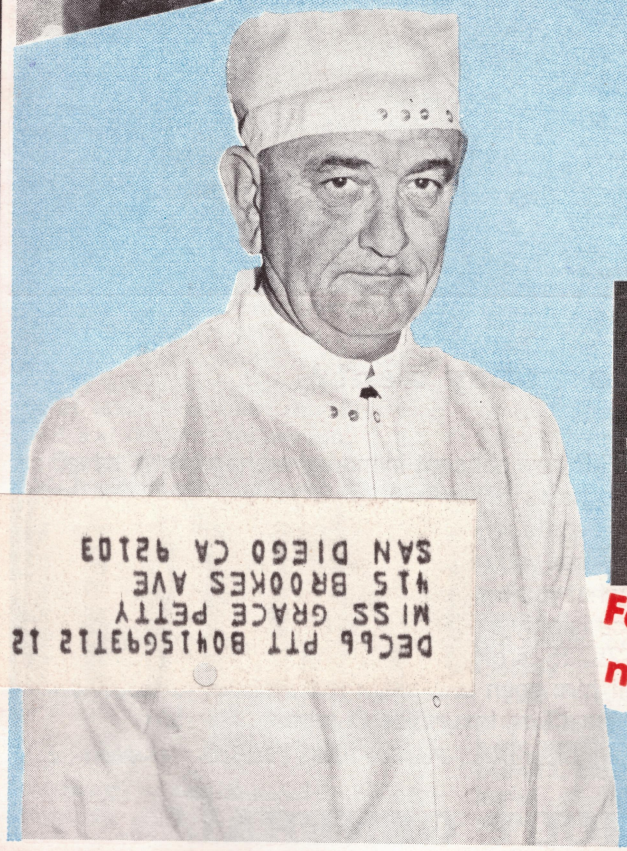
SEPTEMBER 25, 1964

TIME

THE WEEKLY NEWSMAGAZINE

THE NUCLEAR ISSUE





Fear Soviet Breakthrou
n Doomsday Weapon

VOL. 84 NO. 13
(REG. U.S. PAT. OFF.)

TIME
THE WEEKLY NEWSMAGAZINE
September 25, 1964 Vol. 84, No. 13

THE NATION

ISSUES

The Itchy-Finger Image

Republican Barry Goldwater is far, far behind in his race for the presidency —and rather than gaining ground, he is losing it. A Gallup poll last week showed that since July's Republican Convention in San Francisco, Goldwater has dropped by two points, to 31% while Democratic President Lyndon Johnson has gained by six, to 64%. The Gallup survey is borne out by almost every other political indicator.

Why is Barry doing so badly? Certainly not out of any vast national veneration for Johnson. A great number of Americans feel that in voting for Johnson they will only be opting for the lesser of two evils. This feeling was most dramatically described in a Sunday sermon by the Very Rev. Francis B. Sayre Jr., dean of Washington's Episcopal Cathedral and a man who, as Woodrow Wilson's grandson, was born in the White House.

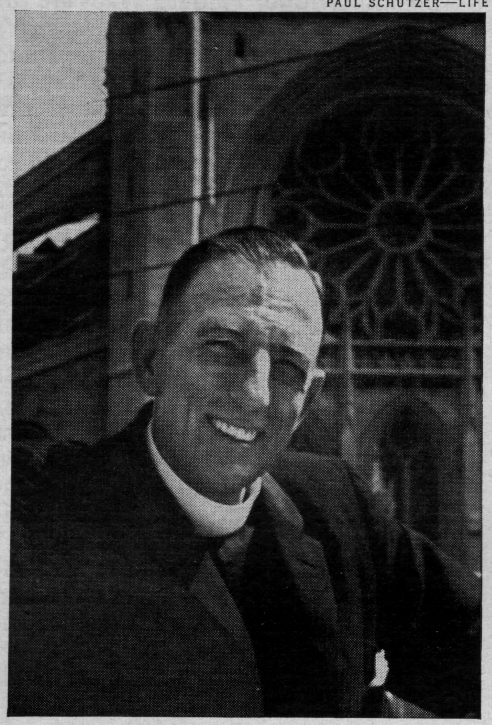
Two Men. "I suspect," said Sayre, "that thousands, even millions, of our countrymen this summer, viewing the extravaganzas that were produced at the Cow Palace in San Francisco and at Convention Hall in Atlantic City, felt something like the Israelites must have felt when finally they were thrust into exile . . . This summer we beheld a pair of gatherings at the summit of political power, each of which was completely dominated by a single man—the one, a man of dangerous ignorance and devastating uncertainty; the other, a man whose public house is splendid in its every appearance, but whose private lack of ethic must inevitably introduce termites at the very foundation.

"The electorate of this mighty nation is left homeless, then, by such a pair of nominees. It knows not where to turn. Our people are in a great dilemma, and there is no corner of the country which you may visit today where you do not feel this profoundly. We stare fascinated at the forces that have produced such a sterile choice for us: frustration and a federation of hostilities in one party; and in the other, behind a goodly façade, only a cynical manipulation of power."

Although he was disputed by his own bishop, the Rt. Rev. William Creighton ("Perhaps I have more confidence in the American people's ability to make wise political choices than the dean has"), Sayre was far from alone in his opinion, as shown in extensive interviews by TIME correspondents.

"I think Goldwater is just beyond belief," says Denver Playwright Robert Owens. "I just don't think he represents the Republican Party. Johnson leaves me very cold, but I am going to ring doorbells for him, and I'm going to vote for him." Says Elizabeth Carey, a Burlington, Vt., secretary (and a Republican): "I don't think too much of President Johnson, but I guess I'm really afraid of Senator Goldwater." Says G. Kinnear Pash, a Los Angeles securities analyst: "In general, you don't find too many people who are very pro-Johnson in the sense that they say 'If I had to pick one man for the White House, I would pick Johnson.' Mostly people are neutral on him and are negative on Goldwater."

PAUL SCHUTZER—LIFE



DEAN SAYRE
To many, the choice is sterile.

Just Plain Scared. But not even such generally expressed opinions answer the basic question. If Lyndon is less than beloved, then why is he running so far ahead of Goldwater? The answer is easy: Goldwater's public image is that of a man with an itchy finger on the nuclear trigger, while Johnson has managed to portray himself as the responsible, restrained keeper of nuclear peace.

Interviews with people of all political persuasions, at all economic and educational levels, in all parts of the U.S., find this sentiment constantly repeated. "Goldwater and his nuclear stand," says Denver Auto Salesman Arnold Grand, "scare me to death." Says Nashville Trucker John A. Wilson: "You've got to think about all this nuclear stuff. I don't think it will ever be used, but with Goldwater in there and the way he talks and acts, I'm afraid we could get in a spot where we'd have to use it."

Atlanta Computer Programmer Dan Roberson says: "Almost everyone I know who's against Goldwater is afraid he'll lead the country into war. It's by far their biggest reason for being against him." Says a Republican physician from Vermont: "I don't like President Johnson's history of political dealings, but I just can't vote for Goldwater. The man is sincere, but he is dangerous in this day and age. I don't think he knows what he is going to say next, and you can't run a country that way in the nuclear age."

While Goldwater vehemently protests that he is not nuke-happy, it is this reputation that is ruining his chances for election (*see following cover story*). Unless and until he can rid himself of the image, he hasn't a hope of entering the White House.

The Fear & the Facts

(See Cover)

A little girl, as pretty as anybody's image of his own daughter, appears on the television screen. She carries an ice cream cone. It certainly looks good enough to eat—but is it? A hoarse, anxious, motherlike voice is heard: "Know what people used to do? They used to explode bombs in the air. You know children should have lots of vitamin A and calcium. But they shouldn't have strontium 90 or cesium 137. These things come from atomic bombs, and they're radioactive. They make you die. Do you know what people finally did? They got together and signed a nuclear test ban treaty. And then the radioactive poison started to go away. But now there's a man who wants to be President of the United States, and he doesn't like this treaty. He fought against it. He even voted against it. He

wants to go on testing more bombs. His name is Barry Goldwater. If he's elected, they might start testing all over again."

Another little girl appears on the screen. She is strolling through a pleasant field. She stoops, picks a daisy, starts plucking its petals while counting, in the fashion of children from time immemorial. "One, two, three . . ." A man's doom-laden voice comes in stronger and stronger, finally drowning out the child's words. The man is counting backward: "Ten, nine, eight . . ." The countdown ends, and the screen erupts in atomic explosion, followed by the voice of Lyndon Baines Johnson, who says somberly: "These are the stakes: to make a world in which all of God's children can live, or go into the dark. We must either love each other or we must die."

These political commercials have recently appeared on television under the sponsorship of the Democratic National Committee. Their obvious implication: if Barry Goldwater is elected President, eating ice cream will be dangerous, and daisy plucking will be a thing of the past.

BASSET—NEW YORK WORLD-TELEGRAM AND SUN

"OKAY . . . WHO'S THE WISE GUY THAT HUNG THIS ON ME?"

Vicious? Of course. But the very fact that such commercials are being used speaks mouthfuls about what now stands as the decisive issue of the 1964 presidential campaign—the argument over control of nuclear weaponry.

An Educational Program. That issue is killing Barry Goldwater. He knows it—and so far he has refused to retreat. He has been scalded by Democrats, pickled by pundits, depicted as a monster by cartoonists, scolded by fellow Republicans. But, insists Barry, "I want to educate the American people to lose some of their fear of the word 'nuclear.' When you say 'nuclear,' all the American people see is a mushroom cloud. Now a nuclear weapon in political terms may be a mushroom cloud. But for military purposes, it's just enough firepower to get the job done."

Lyndon Johnson also realizes the importance of the nuclear issue—and he has exploited it with consummate skill. In his speeches, he constantly uses the words "responsibility" and "restraint." He does not need to mention Goldwater's name: everybody knows who and what he is talking about.

In point of fact, the nuclear issue is one that should be pondered deeply by men everywhere. It certainly has a valid place in any presidential campaign. But so far this year, neither side has fully, accurately, or even honestly explained the basic conflicts involved. As a result there are more confusions and misconceptions about the nuclear issue than about almost any other in recent U.S. political history.

Whose Trigger Finger? What are the facts? Within the context of this year's politics, Goldwater first got himself into nuclear trouble in October of 1963 when, at a Hartford, Conn., press conference, and in his ordinary, offhand fashion, he suggested that NATO "field commanders" (plural) be given greater discretion about when to use tactical nuclear weapons in the event of attack.

Goldwater later insisted that he had been misquoted, that he was referring only to the supreme commander of NATO. No matter. By then the fat was in the fire. In the New Hampshire presidential primary, New York's Governor Nelson Rockefeller, campaigning against Goldwater, cried: "How can there be sanity when he wants to give area commanders the authority to make decisions on the use of nuclear weapons?" Goldwater, not quite to the point, retorted that he had never proposed to "let every second lieutenant" make nuclear decisions.

Since then, under mounting criticism, Goldwater has constantly tried to clarify his stand, and has consistently succeeded in confusing it. As of now, the fair exposition of his position would be:

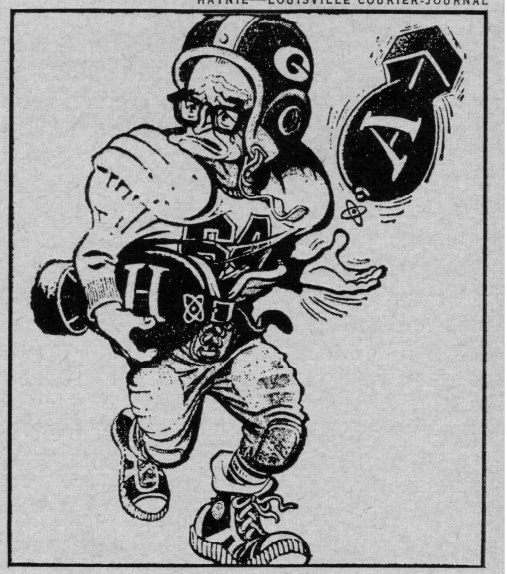
▶ He would give only NATO's Supreme Allied Commander in Europe, presently U.S. General Lyman Lemnitzer, any sort of option to use nuclear weapons without direct, specific authorization from the President of the U.S. He has said: "The NATO commander should not be required to wait until the White House calls a conference to decide whether these weapons should be used."

▶ The option to Lemnitzer would be to use "only tactical, not strategic" nuclear weapons. Goldwater has described these tactical "nukes" as "conventional—any weapon carried by an infantryman or a team of infantrymen." Speaking last month at a Veterans of Foreign Wars convention in Cleveland, he called them "these small, conventional nuclear weapons, which are no more powerful than the firepower you have faced on the battlefield. They simply come in a smaller package."

Dreaming or Leading? Every time Goldwater has spoken on the nuclear issue, his political critics, both Democratic and Republican, have leaped into the argument. Before the Republican Convention in San Francisco, Pennsylvania's Governor William Scranton, then running for the G.O.P. presidential nomination himself, asked: "What does it mean to be a conservative? Does it mean you must be a trigger-happy dreamer in a world that wants from America not slogans but sane leadership?" Again, Scranton said of Goldwater: "He says the decision to unleash nuclear war should be made not by the President but by the commanders in the field."

In Atlantic City, Democratic Convention Keynoter John Pastore cried that "on the question of whose finger should be on the trigger of the atomic bomb, that power today rests solely with the President of the United States. That is exactly where it should remain, and we Democrats mean to keep it

HAYNIE—LOUISVILLE COURIER-JOURNAL



"MOMMY, WHY ARE THE OTHER KIDS 'FRAID T'PLAY WITH ME?"

there . . . I am disturbed when I hear anyone speak so glibly and loosely on the use of these weapons and who should make the decision to use them." The Democratic platform specifically declares: "Control of the use of nuclear weapons must remain solely with the highest elected official in the country—the President of the United States."

Democratic Vice-Presidential Nominee Hubert Humphrey is going around asking audiences: "The question before the electorate is simple, prophetic, profound—which of these men, Lyndon Johnson or Barry Goldwater, do you want to have his hand on the nuclear trigger?" (As against that, G.O.P. Veep Nominee William Miller says that by the time a NATO commander under attack got in touch with Johnson to see if he could use nuclear weapons, it "might be too late if he had to get Lyndon on the phone driving his car at 100 miles an hour in Texas.")

In Ghastly Hues. Johnson himself conjures up Dr. Strangelove-type images of the "madman" who unleashes nuclear war. He paints a picture of any such war in ghastly hues. Said he in his Detroit Labor Day speech: "In the first nuclear exchange, 100 million Americans and more than 100 million Russians would be dead. And when it was over, our great cities would be in ashes, and our fields would be barren, and our industry would be destroyed, and our American dreams would have vanished." Last week, in Seattle, Lyndon upped his casualty figures to 300 million, not including "unborn generations forever maimed." Without ever precisely saying so, he gives the strong impression that he will never let any such catastrophe happen by reason of having delegated an iota of his authority to anyone, including a NATO commander.

Does the President of the U.S. really believe that 100 million of his countrymen would be killed in "the first exchange"? If so, it would be only minimum prudence, not to say Christian charity and perhaps even good politics, for him to begin immediately the greatest shelter-building program imaginable, to save possibly 1%, or 1,000,000, of the doomed.

Ignorance & Inaccuracy. Between the opposing positions on control over the use of nuclear weapons, there is a vast area of ignorance—or, to use the kindest word, inaccuracy.

There is a general supposition that U.S. law requires that the signal for use of any sort of nuclear weaponry must come directly from the President. There is no such provision in the law. The Atomic Energy Act of 1946, as amended, in its most relevant clause provides only that the President may direct the Atomic Energy Commission "to deliver such quantities of special nuclear material or atomic weapons to the Department of Defense for such use as he deems necessary in the interest of national defense."

Of course, the President, in his constitutional role as Commander in Chief of the armed forces, has final responsibility for all matters pertaining to the national defense. But he can, must, and in countless ways does delegate his authority every day of his White House life. There is nothing whatever in the law to prevent him from delegating to, say, a NATO commander, authority to use nuclear weapons under certain circumstances.

Never Any Doubt. Goldwater insists that the President should delegate such authority. Johnson lets on that he can't and won't. The fact is that he already does, as did Presidents Eisenhower and Kennedy before him. In 1957, the congressional Joint Committee on Atomic Energy received written notification that plans were being developed to give NATO's supreme commander in Europe the right to use nuclear weapons in certain contingencies—such as the incapacity of the President or the breakdown of communications between Europe and the U.S.


NATO

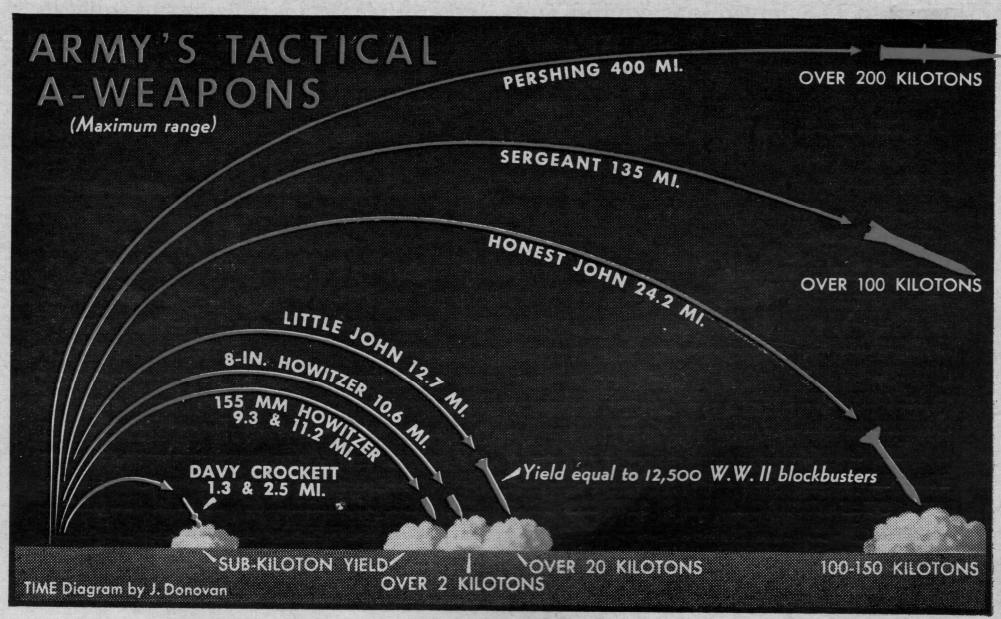
GENERALS LEMNITZER & NORSTAD (1962)
Should there be a White House conference first?

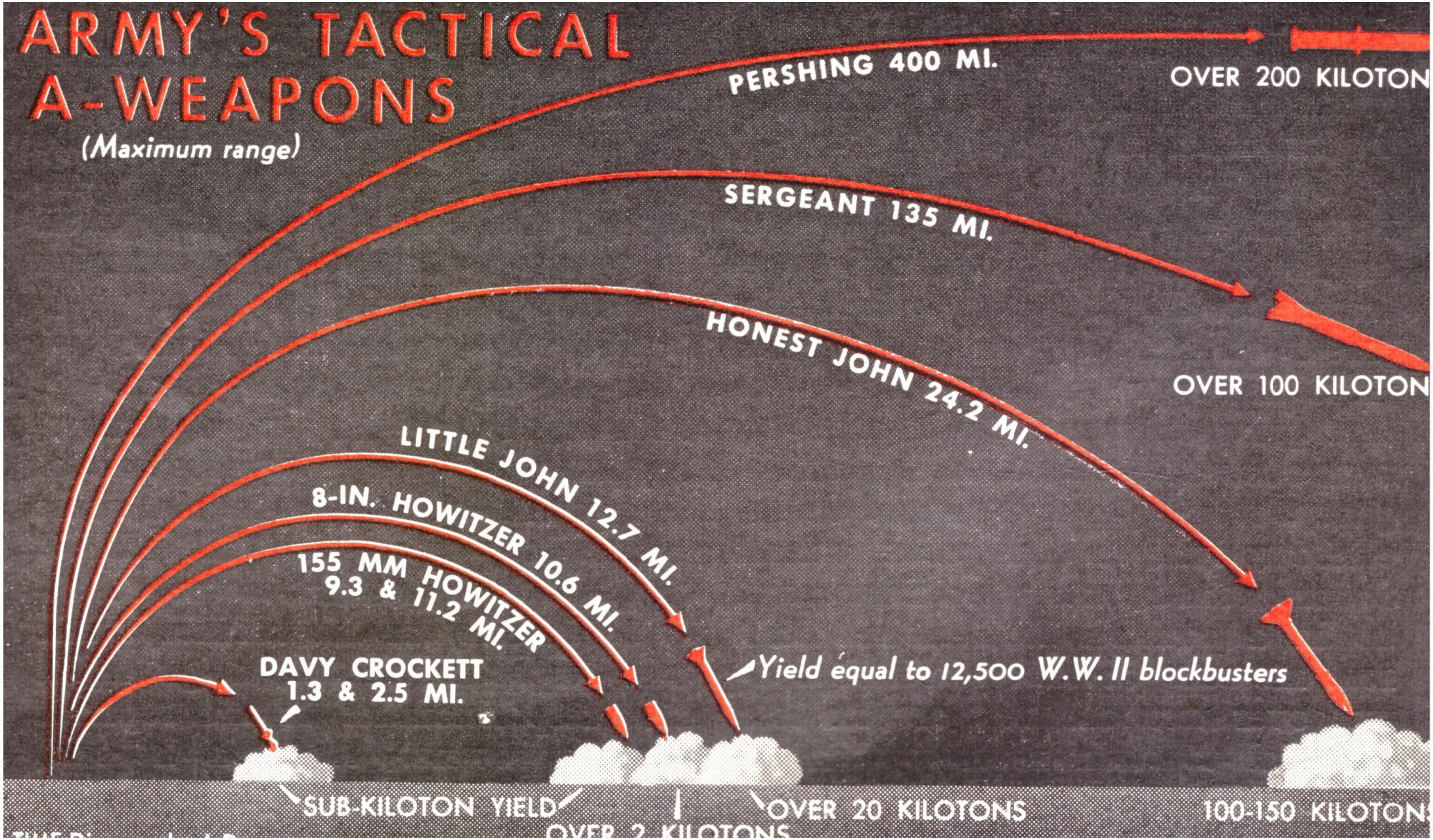
Those plans are now in operation. All are classified top secret, but they apply not only to NATO's commander, but to the commander of the North American Air Defense. Some are written, but word-of-mouth communication between the President and the NATO commander is also important. Former NATO Commander Lauris Norstad, for example, never had any doubt about his authority to act in the event of an attack on Western Europe during the Cuba missile crisis of 1962: he could use his tactical atomic weaponry.

Said Norstad in a recent conversation with a friend: "In every crisis that arose under President Eisenhower and President Kennedy, there never was a time when I felt that there was any possibility of lack of complete meeting of the minds between the President and the Supreme Commander as to what should be done in an emergency."

"Dangerously Misleading." Goldwater shows appalling ignorance when he intimates that there are atomic weapons so small and well-packaged that they can be carried around by an infantryman, and that these weapons do not really have much more explosive power than some of the gunpowder arms of World War II. The fact is that the U.S.'s smallest operational nuclear weapon, the Davy Crockett, carries a minimum power package equivalent to 40 tons of TNT—as opposed to World War II's powerful "blockbuster" bomb, which packed an explosive load of about 1½ tons.

The Davy Crockett, a recoilless rifle, comes in two sizes, one weighing 116 lbs., the other 371 lbs., and can be fired from a tripod by a crew of three men. With a range of up to 2½ miles, the Davy Crockett can annihilate a dug-in infantry battalion, wipe out a massed formation of 45 to 50 tanks, or destroy a huge bridge. Two versions of the 155-mm. howitzer—one a towed weapon weighing 12,700 lbs., and the other a self-propelled weapon weighing 54,200 lbs.—fire an explosive load of 40 to 100 tons up to 11.2 miles. Beyond that, the punch of the Army's tactical nuclear




ARMY'S TACTICAL A-WEAPONS
(Maximum range)
PERSHING 400 MI.
OVER 200 KILOTON
SERGEANT 135 MI.
HONEST JOHN 24.2 MI.
OVER 100 KILOTON
LITTLE JOHN 12.7 MI.
8-IN. HOWITZER 10.6 MI.
155 MM HOWITZER 9.3 & 11.2 MI.
DAVY CROCKETT 1.3 & 2.5 MI.
Yield equal to 12,500 W.W. II blockbusters
SUB-KILOTON YIELD
OVER 20 KILOTONS
100-150 KILOTON

weaponry scales rapidly upward. The 12.7-mile-range Little John rocket carries a power package of over 20 kilotons; the 24.2-mile Honest John 100 to 150 kilotons; the 135-mile Sergeant over 100 kilotons; and the 400-mile Pershing, largest of the Army's "tactical" nuclear weapons, over 200 kilotons. Thus the Johnson Administration's Deputy Defense Secretary, Cyrus R. Vance, has a real point when he says of some of Goldwater's statements: " 'Small' and 'conventional' are dangerously misleading and totally inappropriate when applied to any nuclear weapon."

Crossing the "Fire Break." The Administration's fear of firing any sort of nuclear weapon is based largely on the so-called "fire break" theory. That theory holds that the single step from use of the largest gunpowder weapon to use of the smallest tactical nuclear weapon would mean crossing the "fire break" area between limited war and all-out, intercontinental, thermonuclear disaster. Says Vance: "Once you use any nuclear device, no matter how small, you move completely into another world."

Yet the fact is that since 1954, NATO itself has based its defense planning, even against conventional attack, on "using atomic weapons from the outset of a war." In a mere gunpowder war, NATO planners estimate that their forces could withstand a massive Soviet attack for a bare three days before being forced back to the banks of the Rhine; within 30 days the NATO troops would be swept from the Continent.

Some Strange Blips. Goldwater argues that such critical-area commanders as NATO's Lemnitzer should be given atomic discretion because there is always the possibility that a communications breakdown might consume vital hours before word of a crisis got to Washington. Defense Secretary Robert McNamara's civilian Pentagon says that argument is nonsense, boasts of a worldwide U.S. communications setup that could put a commander in touch with the President within two minutes under any conceivable circumstances.

Last week Goldwater's point received new credibility. The Pentagon went into a headline-screaming flap over reports of another Tonkin Gulf incident. U.S. destroyers in the area reported seeing strange blips on their radar screens, assumed a new attack by North Vietnamese PT boats, started firing. But, if only because of the confusion existing on the destroyers, communication with the Pentagon failed to make clear what actually was happening.

It was a full 28 hours before a tight-lipped McNamara appeared before newsmen to read a 146-word communiqué and refused to entertain any questions. Gist of his statement: two unnamed U.S. destroyers "were menaced" by four "unidentified vessels" and opened fire, after which the "vessels" disappeared.

Between the original alarm and the dénouement, Goldwater seized upon the opportunity to deride the communications system. Snorted Barry: "With the great communications system which McNamara is always bragging about, they are waiting for an airmail letter to find out just what did happen."

Planning to Share. Another element of nuclear "control" has to do with the sharing of nuclear weapons by the U.S. and its NATO allies. Under present law, the U.S. cannot turn over any of its nukes to any ally to be fired at the ally's discretion. But the NATO allies feel strongly that they should have more than nominal influence over the use of the U.S. nuclear weapons that are, after all, their only real defense against Communist invasion.

The dilemma is one that Goldwater seeks to solve with some rather fuzzy talk about "sharing." Says he: "All NATO forces stationed in Europe, regardless of nationality, should be equipped and trained in the use of nuclear weapons, particularly of the so-called battlefield, or tactical, variety." Goldwater has been criticized for this stand, and last week in Seattle, President Johnson, even while admitting that "the dignity and interests of our allies demand that they share nuclear responsibility," warned against the fearful possibility of "nuclear spread."

Yet despite the fact that Goldwater is suffering political damage from his talk about "sharing," the possibility of doing just that has been discussed by NATO-nation leaders for years. The so-called Multilateral Force, first formally promulgated by President Kennedy, is one effort to solve the problem. Under the MLF plan, atom-armed sur-

A PLAN TO SHARE THE WEAPONS

REPUBLICAN GOLDWATER'S suggestion that the U.S. "share" know-how about and control over its nuclear weaponry with NATO allies is one that has been seriously considered by U.S. leaders during the Eisenhower, Kennedy and Johnson Administrations. Last week former NATO Commander Lauris Norstad, now president of Owens-Corning Fiberglas International, appeared before 2,500 people at the Mayo Centennial Symposium in Rochester, Minn., and came up with some "sharing" proposals that would, in his educated opinion, enable the U.S. to "get on with the business of developing a solution that would have some chance of being accepted on both sides of the Atlantic."

Questions. Said Norstad: "For too long we Americans have worked on the assumption that the nations of Europe would be satisfied, or would have to be satisfied, to leave the nuclear elements of the common defense to U.S. invention, control and direction. For a number of years, Europeans have been addressing two questions to Americans with increasing bluntness and urgency.

"First, since the Europeans depend upon the common defense, and since the NATO military forces in Europe themselves depend to a considerable extent on nuclear weapons, should there not be an absolute guarantee that some minimum stock of these weapons will be available in an emergency, even if the U.S. might be inclined to limit its own participation? Second, should not the Europeans be in a position to exercise some real measure of influence and control over weapons that are no less essential to their security than to our own?"

To Norstad, long a strong supporter of a NATO nuclear-strike force, the answer to both questions is yes. Under his plan, NATO's three nuclear producers—the U.S., Britain and France—would create a stockpile of weapons. "Whatever these countries agree to put in," he said, "should, in an emergency, be available in the common interest, unimpaired by the possibility of a last-minute veto by one or another of the nuclear powers." At the heart of Norstad's plan is the creation of an executive committee whose nucleus would be the Big Three. In this respect, the plan is reminiscent of Charles de Gaulle's longstanding—and long-rebuffed—demand for a U.S.-British-French triumvirate to direct NATO. But Norstad adds that the committee he envisions would be "open to all powers whenever their interests may be directly or critically involved."

Majority Rule. How would the committee decide whether to squeeze the nuclear trigger—the key question of all? Said Norstad: "In the interest of prompt decision, the committee, and through it the alliance, should be ruled by the decision of the majority. The majority decision would not bind, at least initially, a nation positively dissenting."

Norstad was the first to admit his plan is "imperfect" as it stands. But he insisted on its merit as a measure toward "putting at least one of the rooms of our house in some order. It would bring the NATO nuclear capability under the collective authority of the alliance, while still respecting the sovereign rights and responsibilities of the separate nuclear powers." As such, he said, "it is worth considering."

face ships and submarines would be manned by mixed crews from all the NATO nations, and any one of those nations would have a veto power over a decision to fire a nuclear weapon.

As of now, the structure of MLF is still being negotiated, and the plan does not seem likely to go much farther. Last week a new and far more sophisticated "sharing" plan was proposed by NATO's onetime Commander Norstad (*see box*).

Deterrent by Declaration. The most obvious proposition in the debate over the use and control of nuclear weapons is that no one wants a nuclear war. Despite all the hot words, this is as true of Goldwater as of Johnson.

Goldwater believes that the best deterrent to such a war is a clear and well-understood declaration that the U.S. will, if necessary, defend its vital international interests with nuclear weaponry. In urging this point, he has indulged in some imprecise language.

He has helped create for himself the political image of a man who would consider using atomic weapons to "defoliate" trees in South Viet Nam so as to deprive Communist guerrillas of their protective jungle cover. He has been mistaken in saying that the smallest nuclear weapon is no more powerful than World War II artillery charges. He has, in many ways, given the impression of a man who does not really know what he is talking about, and should not, therefore, be permitted to put his atomic ignorance into effect as national policy.

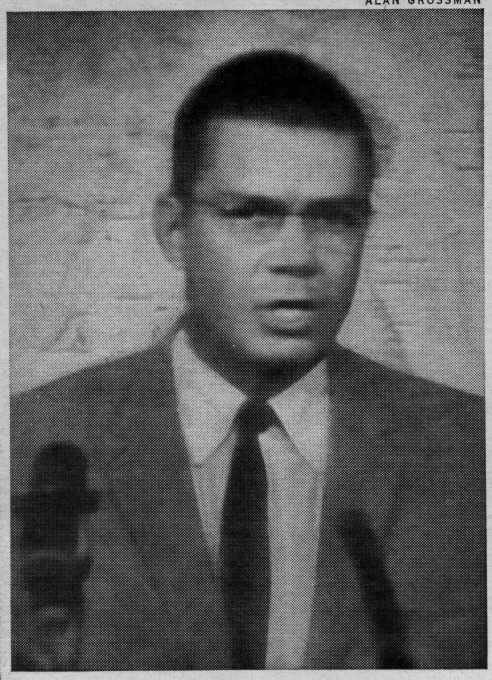
Johnson, superb politician that he is, has taken advantage of almost everything Goldwater has said. Campaigning for re-election as the great peace keeper, he keeps invoking "national security" as a brake on what he can say. But he has not said all he could, and he has indulged in some imprecision himself. He gets across the notion, for instance, that Goldwater is irresponsible and reckless because he has suggested that NATO's supreme commander ought to be given some sort of contingency authority for using tactical nuclear weapons—at a time when General Lemnitzer, under a delegation of power from Johnson, has just such authority.

One Billion Tons. Will the nuclear issue be clarified, and cooled off, before election day? Perhaps too much has already been said, and badly said at that, by the two candidates, for them ever to engage in meaningful debate.

Just last week Russia's Nikita Khrushchev told some visiting Japanese that the Soviet Union has perfected a sensational new weapon "that is a means of the destruction and extermination of humanity."

What was the weapon? Was it what famed U.S. Physicist Ralph Lapp calls a "gigaton" bomb—a nuclear weapon packing the power of a billion tons of TNT that could be detonated 100 miles off the U.S.'s coastline and still set off a 50-ft. tidal wave that would sweep across much of the entire North American continent? Was it a cobalt bomb that would send a deadly cloud sweeping forever about the earth? A "death ray" or a germ bomb? Or even an empty boast? Two days later Nikita Khrushchev said it wasn't nuclear, and, besides, he had been misinterpreted. For public consumption, his weapon had been cooled off.

ALAN GROSSMAN



SECRETARY McNAMARA ON TV
Getting the word can be tough.

It was quite a performance, and one that only a dictator could bring off. But, as one U.S. journalist warned, it would be "struthious"* folly to ignore the implications of what Khrushchev said. In the same sense, it would be struthious for the U.S. electorate to base its November judgment on the notion that either presidential candidate has discussed the nuclear control issue accurately or fully.

THE CAMPAIGN

The Old Nonpoliticker

Sacramento's shrieking, surging mob of some 100,000 sent Lyndon Johnson into transports of delight. After reluctantly escaping from his admirers, Johnson winked at aides, chortled and asked: "Now how was *that* for a crowd?" "Oh," replied a staffer, "pretty good." For a moment, Lyndon looked as though he had been smacked in the face with a wet mop. Then he realized that he was being joshed, and grinned more broadly than ever.

The Sacramento ovation was a highlight of a Johnson week that was billed as "nonpolitical." But if Lyndon gets any more nonpolitical than he was last week, heaven help the Republicans.

Nonexistent Speechwriter. Johnson did, of course, make a few bows to political nonpartisanship. On a flight to Miami Beach to deliver a speech to the International Association of Machinists, he took a look at the text that had been prepared for him, crossed out 19 paragraphs that he considered too controversial. Deleted, for example, was a section pointing out that the Communist takeover of Cuba occurred in 1959 (during a Republican Administration) and that the island has since become a "showcase of failure."

Trouble was, reporters had already been given advance texts of the speech, and were starting to write their stories when White House Press Aide Malcolm Kilduff, traveling on the newsmen's plane, ordered that no mention of the deleted paragraphs should be made. Intimating that the objectionable sections had been put in by White House speechwriters unbeknownst to Lyndon, Kilduff ordered: "No reference—repeat, no reference—will be made to that part which has been deleted."

As it happened, every newsman present knew that L.B.J. likes to give the impression that he is the original author of all of his speeches. A reporter coyly asked how a speechwriter (nonexistent) could possibly put anything into a speech that the President himself had written. Kilduff, painted into a corner by L.B.J.'s little fiction, could only smile ruefully and say to the reporter: "You son of a bitch."

Peep Through the Periscope. And so, on to Miami Beach, where Lyndon delivered a sterilized, above-the-battle, President-of-all-the-people speech to the Machinists, then whisked on up to Cape Kennedy for an unscheduled inspection tour. There he donned a surgical-looking white nylon cap and gown, went through a pre-satellite-shoot "clean room," peered through a periscope at a Saturn rocket being groomed for flight, gave missile workers a few little keeper-of-the-peace pep talks.

But all this was prelude to his biggest nonpolitical trip of the week—a two-day sortie to the Far West to meet Canada's Prime Minister Lester Pearson and sign a Columbia River treaty between the two nations. Maybe the presidential jet just kept running out of gas—but in any event there were five stops before and after, from which Tammany's old bosses could take lessons in the fine old art of nonpoliticking.

The President flew first to Malmstrom Air Force Base in Great Falls, Mont., plunged into a crowd of 7,000 for some handshaking, accepted a pair of beaded moccasins (size 10—but he's size 12) from a group of Indians, was so caught up in it all that he nearly missed the arrival of Canada's Pearson.

Pearson steered Lyndon aboard his Canadian government JetStar, and the two settled down for a two-hour flying inspection of three dam sites designed to harness the waters of the Columbia River system for huge hydroelectric and irrigation projects.

When Johnson stepped off the JetStar in Vancouver, British Columbia, he was outside the U.S. for the first time since

* Ostrichlike.

ENTOMOLOGY

The Beetle with Go Power

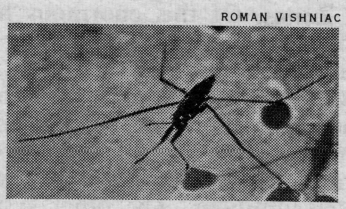
Insects have a long list of ingenious means for fending off predators. They go in for camouflage coloring and offensive odors; in some cases they even mimic other insects that their enemy has no taste for. But few match the imaginative arsenal of the little (quarter-inch long) *Stenodus* beetle, which has a defense mechanism as sophisticated as tomorrow's anti-missile missile. Attacked by a water strider, a fast, long-legged bug that is its customary nemesis, the *Stenodus* simply squirts out a charge of fluid detergent from a pair of abdominal glands. The detergent destroys the thin elastic layer of water that marks the boundary between fluid and air. With that surface tension gone, a small water wave rises and propels the *Stenodus* out of danger. When the attacking water strider, which is normally supported by the film of surface tension, tries to follow, it sinks and drowns.

45 Feet at Top Speed. This novel means of protection was discovered almost accidentally by German Entomologists Karl Linsenmair and Dr. Rudolf Jander of Freiburg Zoological Institute. In flooded gravel pits alongside the Karlsruhe-Basle autobahn, the two men were studying the orientation mechanism by which the *Stenodus* does its navigation.

The more Linsenmair and Jander watched, however, the more they were struck by another phenomenon. The *Stenodus* beetles normally move across water by slow paddling. But whenever they were attacked, they spurted out of danger at much greater speed. They can travel 2½ ft. a second and can continue at that pace as far as 45 ft. This rapid motion had been noted by entomologists since the turn of the century, but no one had explained it. Linsenmair and Jander discovered that the *Stenodus*' getaway power came from its internally manufactured detergent.

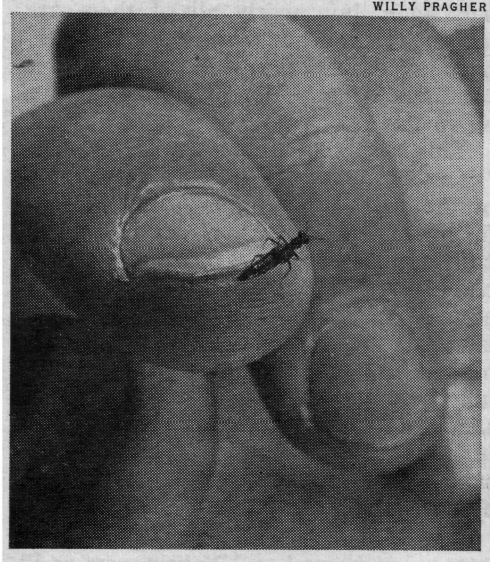
Kills Every Time. If a *Stenodus* exhausts all of its detergent in one 45-ft. dash, it needs a week or more to replenish its supply. But the canny beetle seems to know this and uses its emergency throttle sparingly. Linsenmair and Jander watched *Stenodus* beetles turning and weaving like PT boats, as if to catch their enemies squarely in their wakes. Like most weapons, though, the *Stenodus*' go power can be out-maneuvered: the detergent works only astern, and water striders on frontal-attack patterns made kills every time.

ROMAN VISHNIAC



WATER STRIDER

WILLY PRAGHER



DEFENDER STENODUS
For the attacker, death by detergent.

ELECTRONICS

Making Resistors with Math

Brief, high-power pulses of electrical energy throbbing through intricate circuitry are the heartbeats of modern radar. But they are the bane of many an electronics engineer. Sometimes the high-frequency currents that are crammed into a pulse swirl through a simple resistance as if it were also a small coil (inductance); sometimes the pulses treat the resistance as if it were a capacitor. Either way, coil or capacitor, those unwanted effects introduce annoying problems.

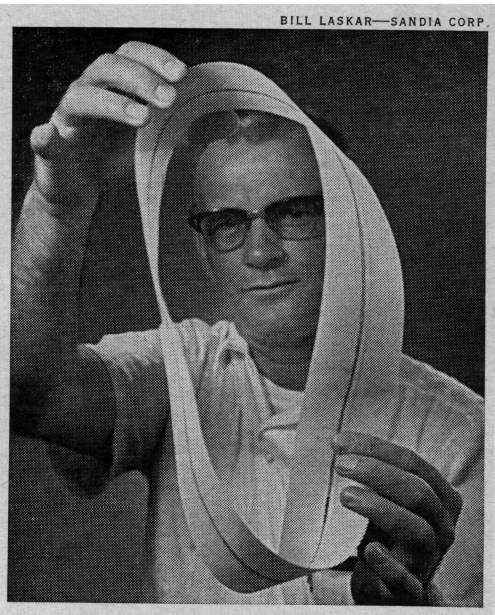
In an effort to reduce such side effects, electronics experts have resorted to all sorts of tricks. But in most cases the best they could do was follow advice as old as Scottish Physicist James Clerk Maxwell, the father of electrical theory, who died in 1879. It was Maxwell who pointed out that resistors could be bent into hairpin turns so that their current flowed in two directions, canceling out capacitance or inductance. Later, Physicist Georges Chaperon wound resistances into intertwined coils with the same result.

Wandering Mind. Those solutions work well, but not quite well enough for today's high-power equipment. At Sandia Corp. in Albuquerque, Physicist Richard L. Davis was busy trying to devise improvements. One day he let his mind wander and remembered an old mathematical parlor trick, the Möbius loop.* Math suddenly merged with electronics, and Davis had what he was searching for: the design of a noninductive Möbius resistor.

A Möbius loop can be made by cutting a narrow strip of paper and gluing its ends together after giving the strip a half-turn. The loop that results has peculiar qualities. Most important, though the paper it is made of has two sides, the loop itself has only one surface. This can be proved by drawing a pencil line down the middle of the strip. The pencil line covers both sides of the paper and returns to the starting point without the strip's being turned over. When cut along the pencil line, the paper forms not two loops but one long, narrow loop. Cut once more in the same manner, the narrow loop becomes two interlocked loops.

* Named for German Mathematician August Möbius, 1790-1868.

BILL LASKAR—SANDIA CORP.



PHYSICIST DAVIS & MÖBIUS LOOP
To pamper pulses, an old parlor trick.

Double Passage. Davis made a Möbius loop out of a strip of nonconducting plastic that had metal foil bonded to both sides to serve as an electrical resistance. He attached wires to the foil on opposite sides of the strip. When he sent electrical pulses through those wires, the current divided, flowed in both directions through the foil, and passed itself twice. Because of the double passage, the inductance was as low as Davis had hoped. He is delighted but still puzzled. The pulses apparently pass right through themselves, and he cannot be sure how or why his device works. "Maybe Maxwell could tell us," he says, "but he's dead."

ASTRONOMY

The Prevalence of Planets And the Probability of Life

Science fiction crawls with intelligent BEMs (bug-eyed monsters) and humanoids (manlike creatures) that live on planets revolving about distant stars. Most fact-fancying scientists are far more skeptical. Somewhere in the universe, they say, there may indeed be a scattering of planets with salubrious atmospheres and temperatures, and something like earthly life. But the planets are probably few, and the odds against finding or communicating with their far-out creatures, say the skeptics, are exceedingly high.

Caltech Geochemist Harrison Brown

demurs. It is a good bet that populated planets are spotted throughout the universe, says he, and their civilized inhabitants may well be trying to talk to earth.

Invisible Bodies. In *Science*, Dr. Brown spells out his reasons for believing in the prevalence of populated planets. The stars that man sees in the sky, he says, are masses of matter big enough to support thermonuclear reactions that give off a great deal of light. Objects with less than 7% of the mass of the sun do not shine.

According to Brown's estimate, the 10,000 cubic parsecs* of space around the sun contain about 1,000 visible stars. Most of them are comparatively small; the smaller and dimmer being the most numerous. But stars that are too small and dim cannot be seen unless they are very near the earth, so their apparent number is low. If they are slightly smaller still, they give no light and cannot be seen at all.

This does not mean that they do not exist. There is good evidence, says Brown, that when such visible stars condensed out of primitive gas and dust, many smaller bodies were also formed at the same time. Seven invisible objects somewhat bigger than Jupiter have already been detected by the wobbling motion that they cause in the stars around which they revolve. Dr. Brown estimates that 10,000 cubic parsecs of space contain 12,730 invisible bodies with sizes ranging from one-sixth the mass of the sun down to "earth equivalent"—the mass that the earth would have if its original hydrogen and other gases had not been driven off by the heat of the nearby sun. Small bodies down to "Mars equivalent" number 60,330, which makes them 60 times as common as luminous, visible stars.

Life Zones. Of this enormous heavenly host only the sun's planets are near enough to be seen by reflected light, but most of the rest are probably organized in planetary systems too. Dr. Brown believes that nearly half of these groups contain no central body large enough to be self-luminous. The other systems contain an average of about 50 members each, but nearly all of them are too cold or too hot to support life. Perhaps two planets per luminous star have conditions suitable for life as it is known on earth.

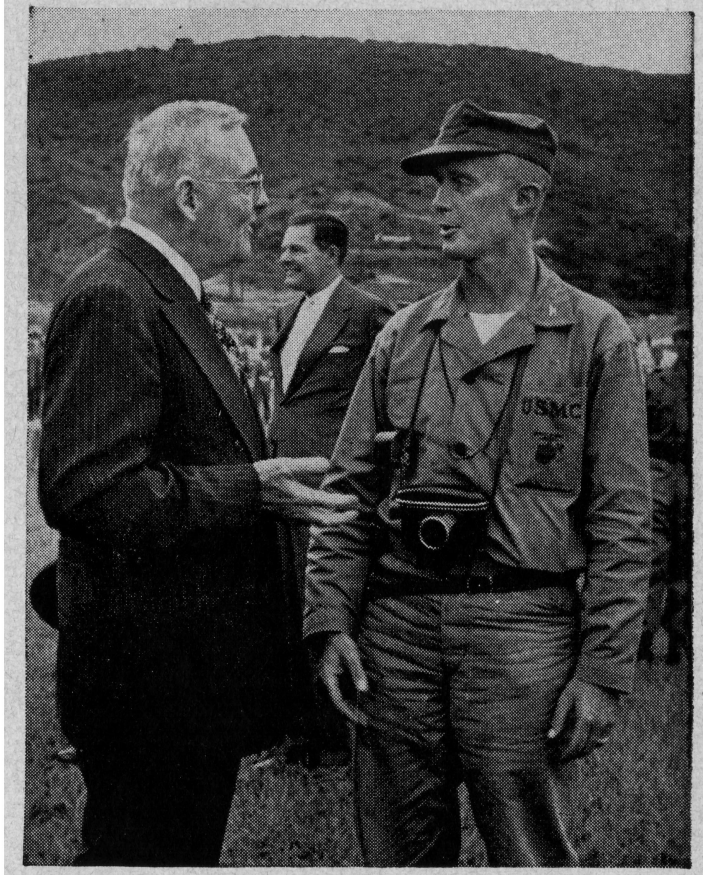
This adds up to a vast number of "life-zone" planets—at least 200 billion in the Milky Way galaxy alone—and if planets smaller than Mars are included, the number is greater still. "If planetary systems are indeed extremely abundant," says Dr. Brown, "one might conclude with equal conviction that man is not alone—that his equivalents may occupy hundreds or even thousands of bodies within our galaxy. Listening for evidence of the existence of such forms may indeed prove a profitable and exciting pursuit."

* A parsec is equal to 3.26 light-years or 19 trillion miles.

P. 50

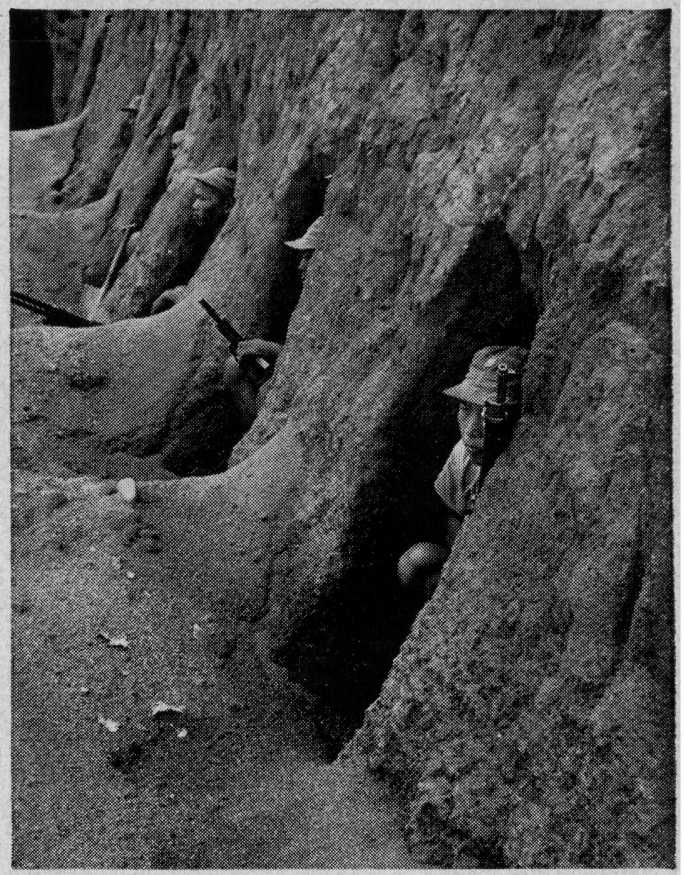
CUBAN MISSILE CRISIS

THESE ALMOST BECAME NEW WAR FRONTS FOR U.S.



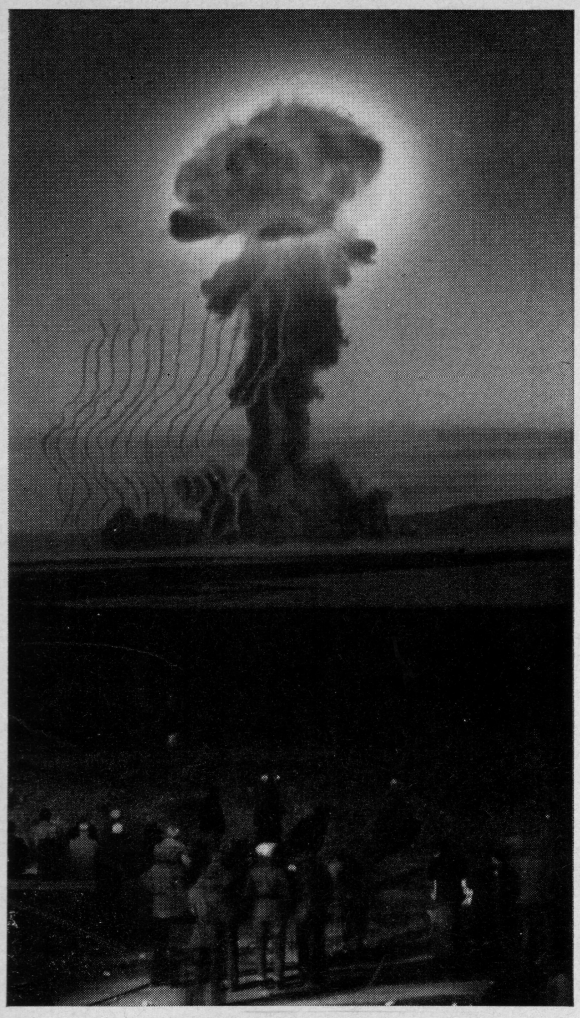
IN KOREA Dulles confers with Owen A. Chambers after truce, which followed his warning to Peking.

AT DIENBIENPHU air drop is in vain. But Dulles' threat of allied intervention saved part of Indochina.



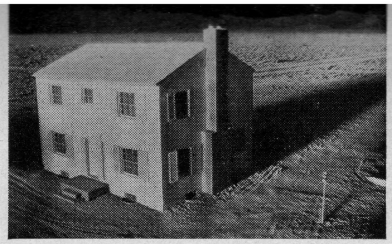
ON QUEMOY defenders await Red attack. But the U.S. promised retaliation and attack did not come.

Vol. 34, No. 13 LIFE March 30, 1953



A-BOMB'S CLOUD rises from desert floor seven miles from observers at News Nob (*foreground*). Trails left by the rockets (*left*) serve as a guide to measure shock wave.

3,500 FEET



AT 0/0, in the first millisecond of the bomb's explosion, its light casts an unearthly glare on test house No. 1.

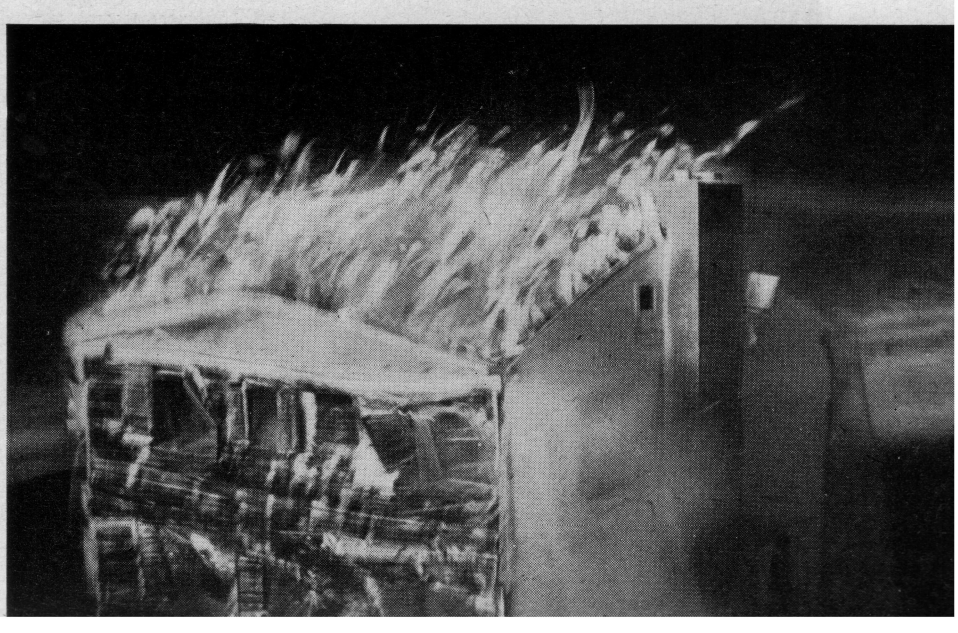
AT 11/24 SECOND head of explosion scorches window frames and door facing the explosion. Light from bomb's rising ball of flame diminishes the shadow behind house.

AT 3/4 SECOND (*above*) entire front of house is engulfed in flame ar lowing black smoke. Below, at 1 19/24 second, the follow-up shock wave out the fire, rips shingles from the roof, and starts ripping the house to p

A-BOMB VS. HOUSE

Americans had touched off atomic bombs 34 times since 1945, but last week's bomb test on the Nevada desert was again a first. The Atomic Energy Commission, working with civil defense teams, had set about to demonstrate what an A-bomb would do to a house. It was also the first time troops had been dug in as close as two miles from Ground Zero, the point directly below where the bomb was detonated.

Workmen had built two $18,000 sacrificial six-room houses, House No. 1 (*at top right*) 3,500 feet from Ground Zero, and House No. 2, 7,500 feet away. Civil defense officials were on hand to witness the blast, and millions of Americans, just finishing breakfast or still drowsy from sleep, watched it on TV. But none saw so clearly as an automatic camera which, sheathed in steel and mounted on a tower on Yucca Flat, took these pictures of what hap-



rising ball of flame diminishes the shadow behind house.

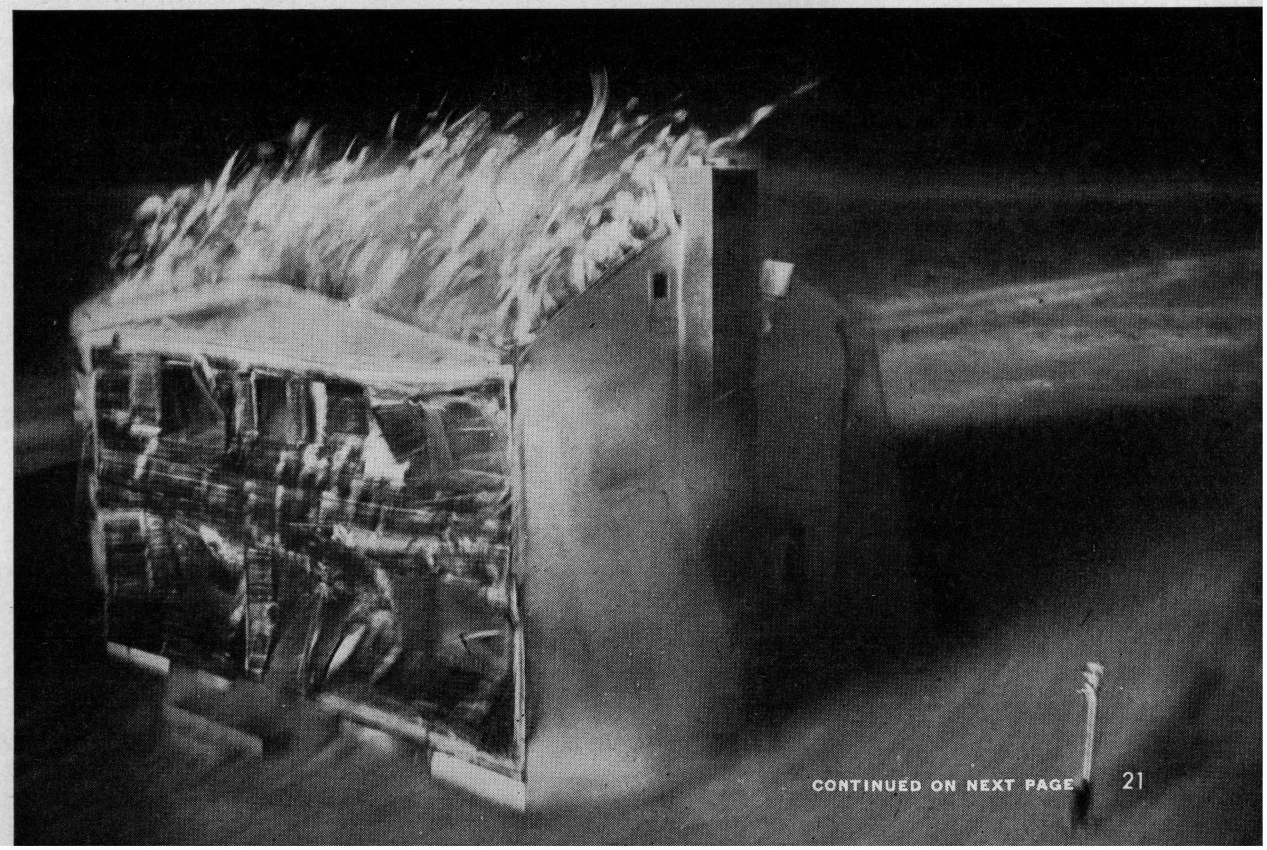
A-BOMB'S CLOUD rises from desert floor seven miles from observers at News Nob (*foreground*). Trails left by the rockets (*left*) serve as a guide to measure shock wave.

A-BOMB VS. HOUSE

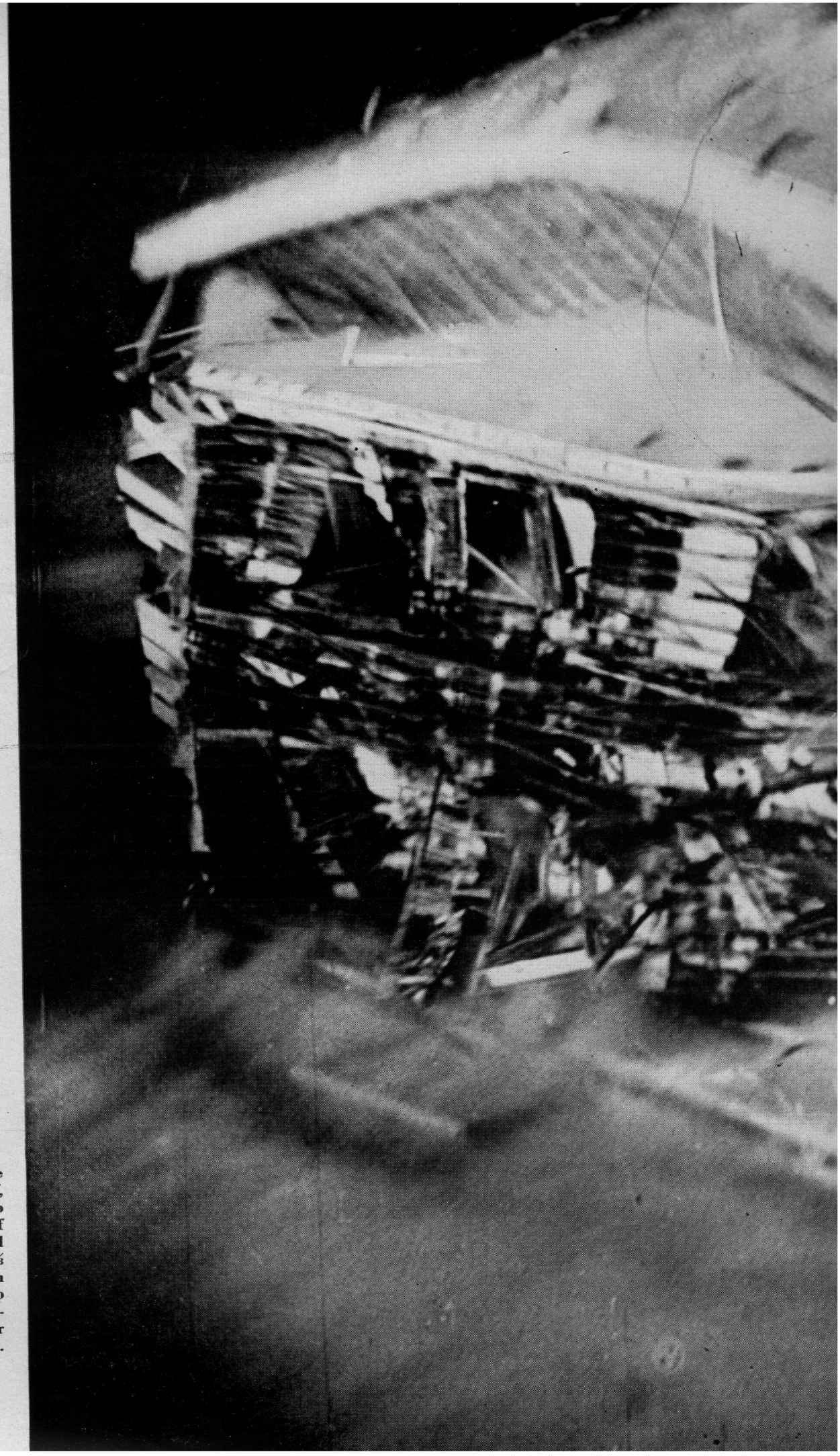
Americans had touched off atomic bombs 34 times since 1945, but last week's bomb test on the Nevada desert was again a first. The Atomic Energy Commission, working with civil defense teams, had set about to demonstrate what an A-bomb would do to a house. It was also the first time troops had been dug in as close as two miles from Ground Zero, the point directly below where the bomb was detonated.

Workmen had built two $18,000 sacrificial six-room houses, House No. 1 (*at top right*) 3,500 feet from Ground Zero, and House No. 2, 7,500 feet away. Civil defense officials were on hand to witness the blast, and millions of Americans, just finishing breakfast or still drowsy from sleep, watched it on TV. But none saw so clearly as an automatic camera which, sheathed in steel and mounted on a tower on Yucca Flat, took these pictures of what happened to House No. 1, which could happen to any American house within a mile of an atomic blast, in the darkness of the desert dawn.

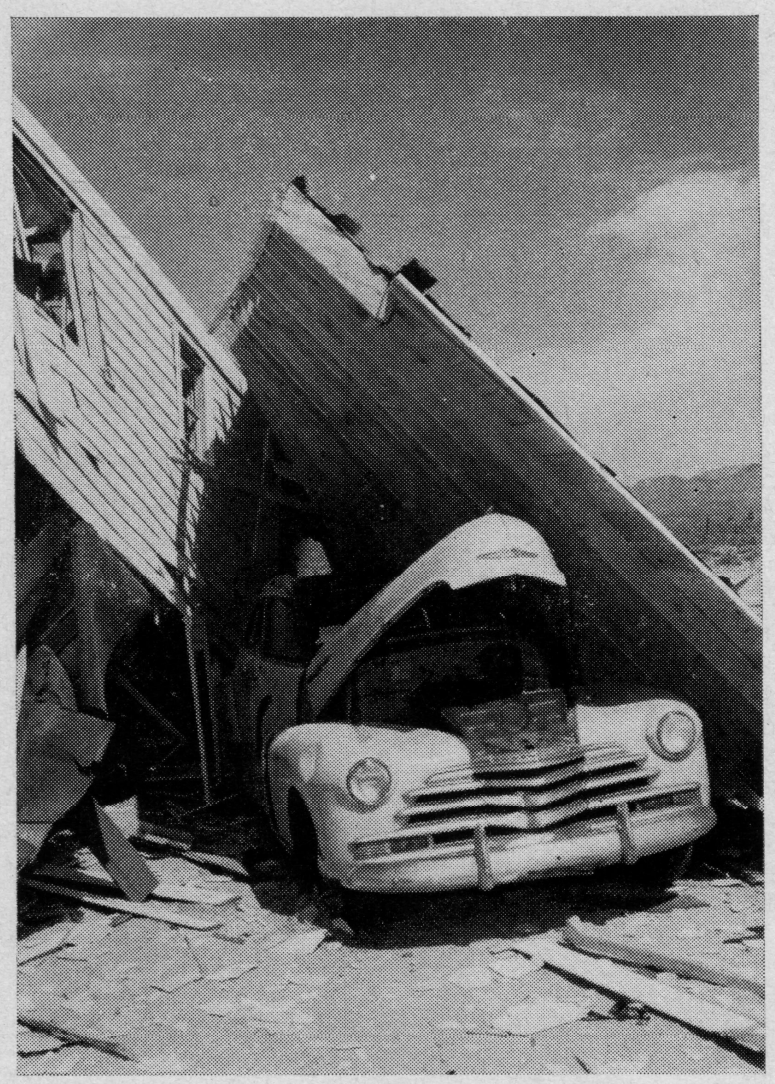
AT 3/4 SECOND (*above*) entire front of house is engulfed in flame and billowing black smoke. Below, at 1 19/24 second, the follow-up shock wave snuffs out the fire, rips shingles from the roof, and starts ripping the house to pieces.



CONTINUED ON NEXT PAGE

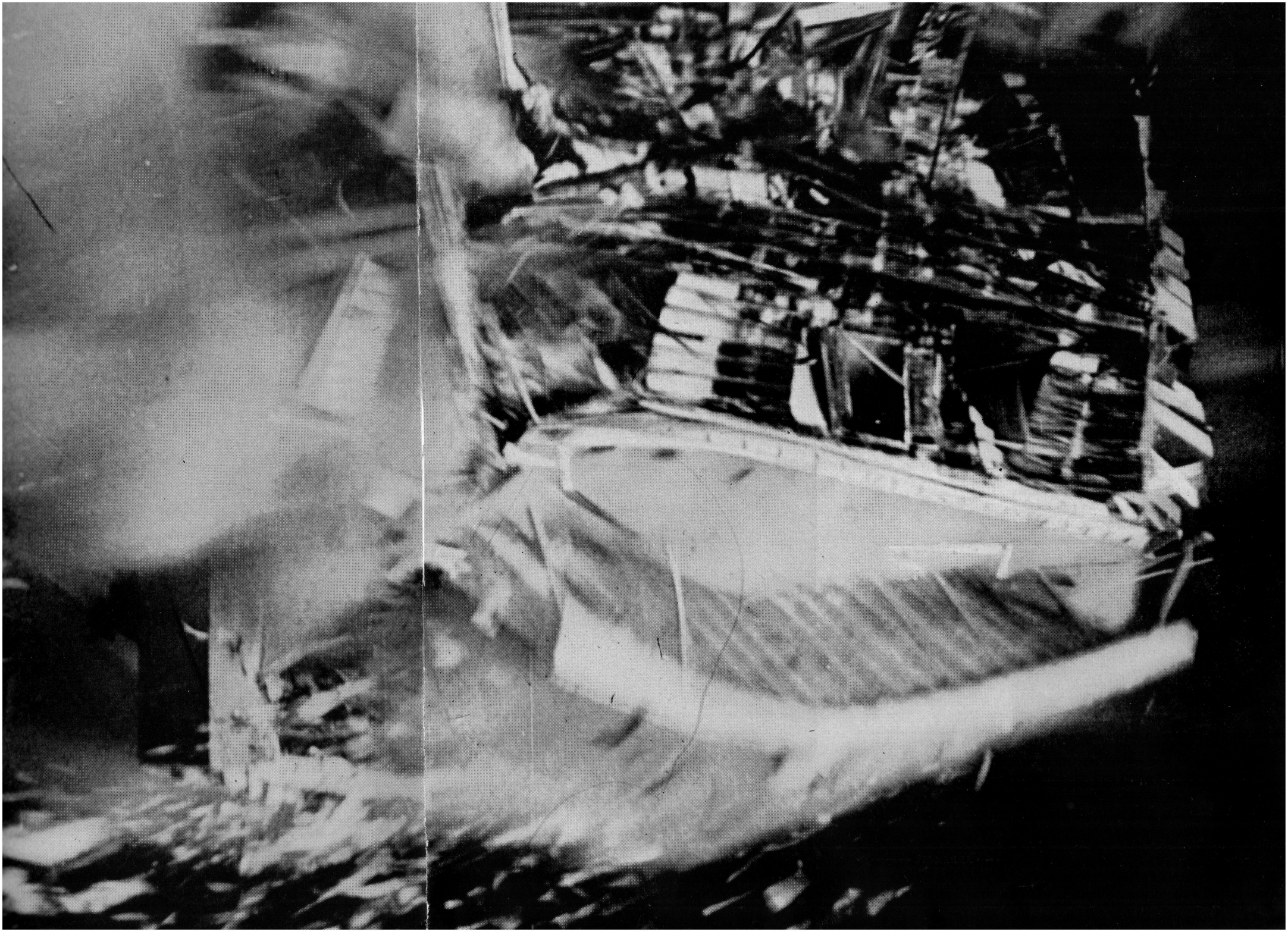


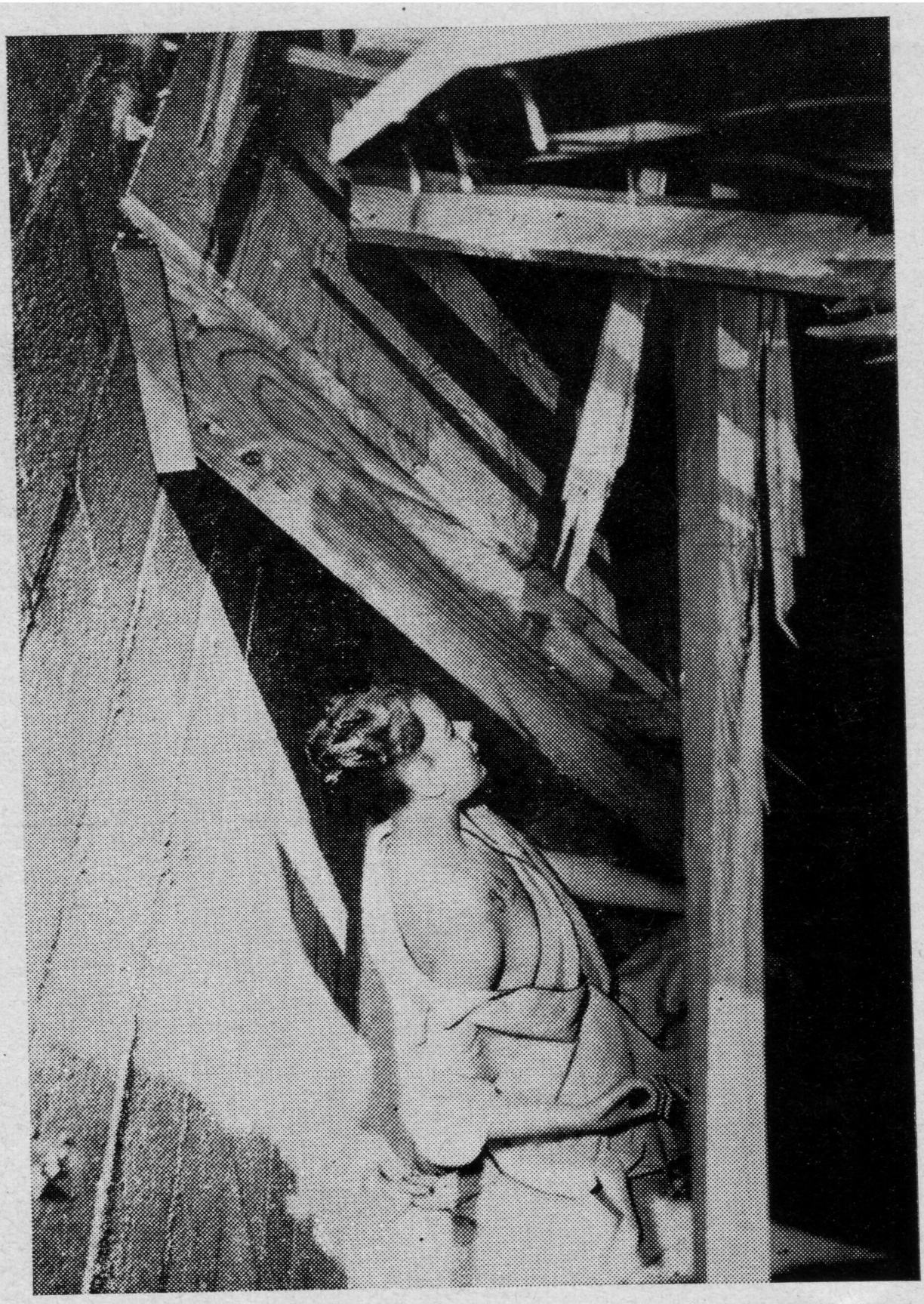
AT 1⅞ SECONDS the concussion tears the roof off, rafters and all, causing it to balloon upward from front of the house. The air is filled with flying lumber. By 2⅛ seconds the first house on the American continent to be destroyed by atomic energy had been reduced to char and radioactivated kindling.



CRUSHED CAR parked behind House No. 1 was badly dented by blast before roof fell on it. Hood of car was sprung by blast, but motor was unharmed.

REMAINS OF HOUSE, twisted and tilted, show worst damage in front. Close-up pictures were taken two days after blast, when radiation level had fallen.





BLAST "SURVIVOR," a display-window model placed in a $40 lean-to shelter in basement, is safe although the radiation effects were not determined.

LIFE

REG. U.S. PAT. OFF.

Vol. 20, No. 2 **INTERNATIONAL EDITION** January 23, 1956

Published by TIME Incorporated

EDITOR-IN-CHIEF
Henry R. Luce

PRESIDENT
Roy E. Larsen

MANAGING EDITOR
Edward K. Thompson

DEPUTY MANAGING EDITOR
Robert T. Elson

ASSISTANT MANAGING EDITORS
Philip H. Wootton Jr.
George P. Hunt

EDITORIAL PAGE
John K. Jessup

ART DIRECTOR
Charles Tudor

EDITOR,
INTERNATIONAL EDITIONS
William P. Gray

EDITION EDITOR
John Jenkisson

ASSOCIATE
Lois Stover

PUBLISHER
Andrew Heiskell

TIME-LIFE INTERNATIONAL

MANAGING DIRECTOR
Edgar R. Baker

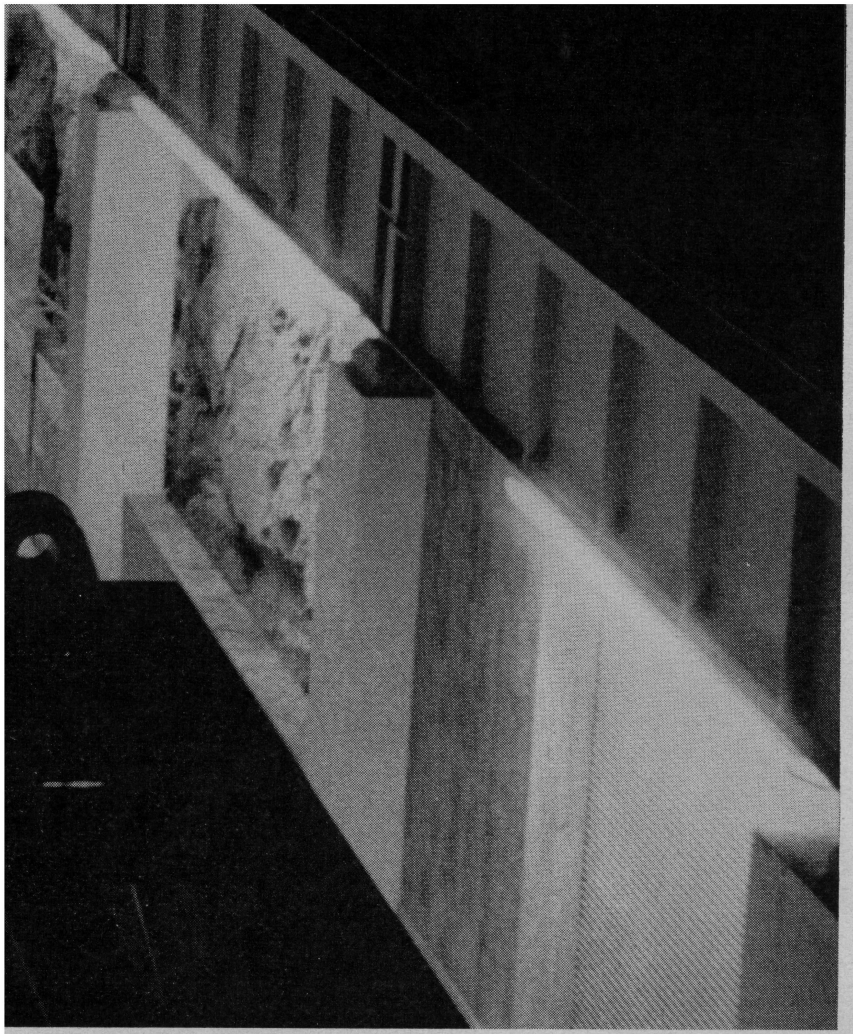
ADVERTISING DIRECTOR
John E. Woolley

IN THE 285,000-KW KILFORSEN HYDROELECTRIC POWER STATION GENERATORS WORK 300 FEET DEEP IN GRANITE. TURBINES ON FLOOR BELOW GENERATORS

ALREADY INSIDE ROCK ARE POWER STATIONS,

Secure from nuclear warfare havoc, the 1,880-ton Swedish destroyer *Uppland* (*preceding page*) nestled in a coastal cavern hewn out as part of a massive undertaking the Swedes call "Operation Granite." All over Sweden workmen have been blasting away at a $300-to-$400 million program of going underground. As the world entered the era of the 3-F bomb (LIFE International, Dec. 26), other free nations staked their wartime survival on alliances and the ability to hit hostile bombers before they reach their targets—or even before they take off. Sweden rejects this concept, preferring to trust its safety to its own forces and the passive defense represented by the shelter scheme of Operation Granite.

Though under way in World War II, Operation Granite really got going during the Korean war. It is now a normal part of Swedish spending, planning and living. Sweden's civil defense spends 17 times as much per capita as its U.S. counterpart. New electric power plants are being located in rock. Clerks of Stockholm's PUB department store use its shelter as a shipping room. The staff of Söder Hospital is trained to



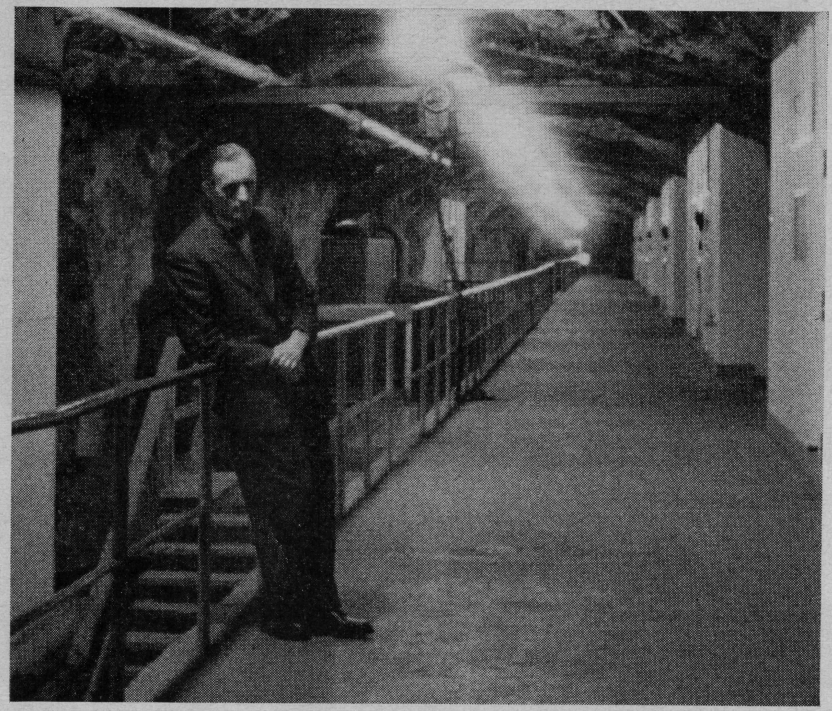
ARE TURNED BY WATER BROUGHT DOWN IN A 100-YARD VERTICAL TUNNEL

FILES AND FACTORIES

carry on in underground wards, and many workers toil the year round in subterranean factories. The Swedish army, navy and air force alone have more than 500 rock shelters in use or under construction.

As he took the photographs on these and the following pages, LIFE Photographer Carl Mydans found Swedish engineers and officials taking deep pride in Operation Granite. Their pride received a new boost when U.S. Civil Defense Chief Val Peterson, after a visit, declared that Sweden would soon be the country "best qualified to meet an atomic attack."

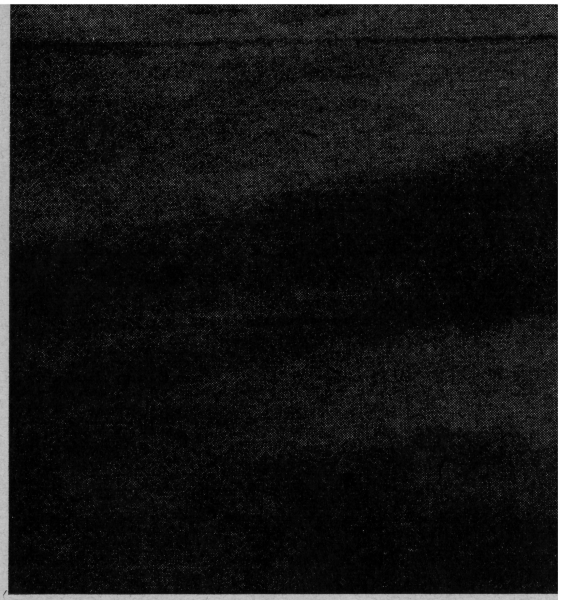
VITAL INDUSTRY, the making of aircraft gyrostabilizer parts, goes on in subterranean section of AGA factory. Less important part of plant is above ground.



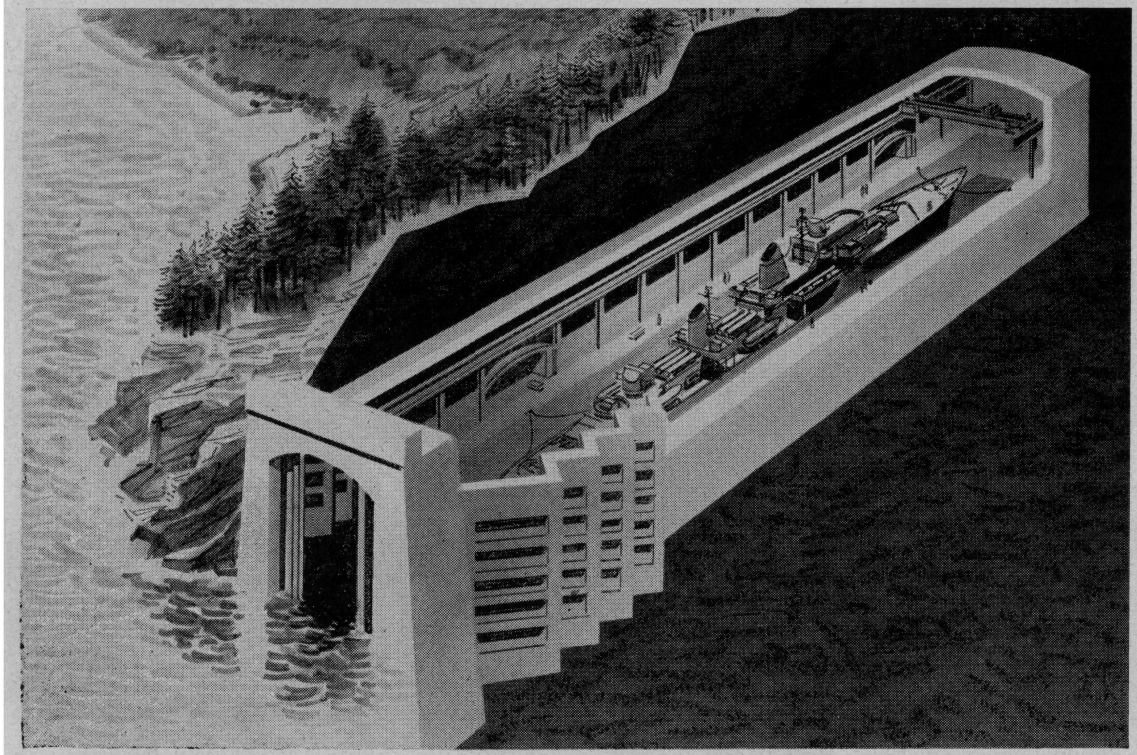
SEWAGE PLANT serving three quarters of Stockholm was gradually installed underground from 1941 to 1953. This is the chief engineer, Gustaf Brundin.

CONTINUED

THE ONLY ATOMIC REACTOR IN SWEDEN, AN EXPERIMENTAL MODEL, IS BURIED 85 FEET UNDERGROUND



INSIDE A MOUNTAIN BASE, SWEDISH-BUILT J-29



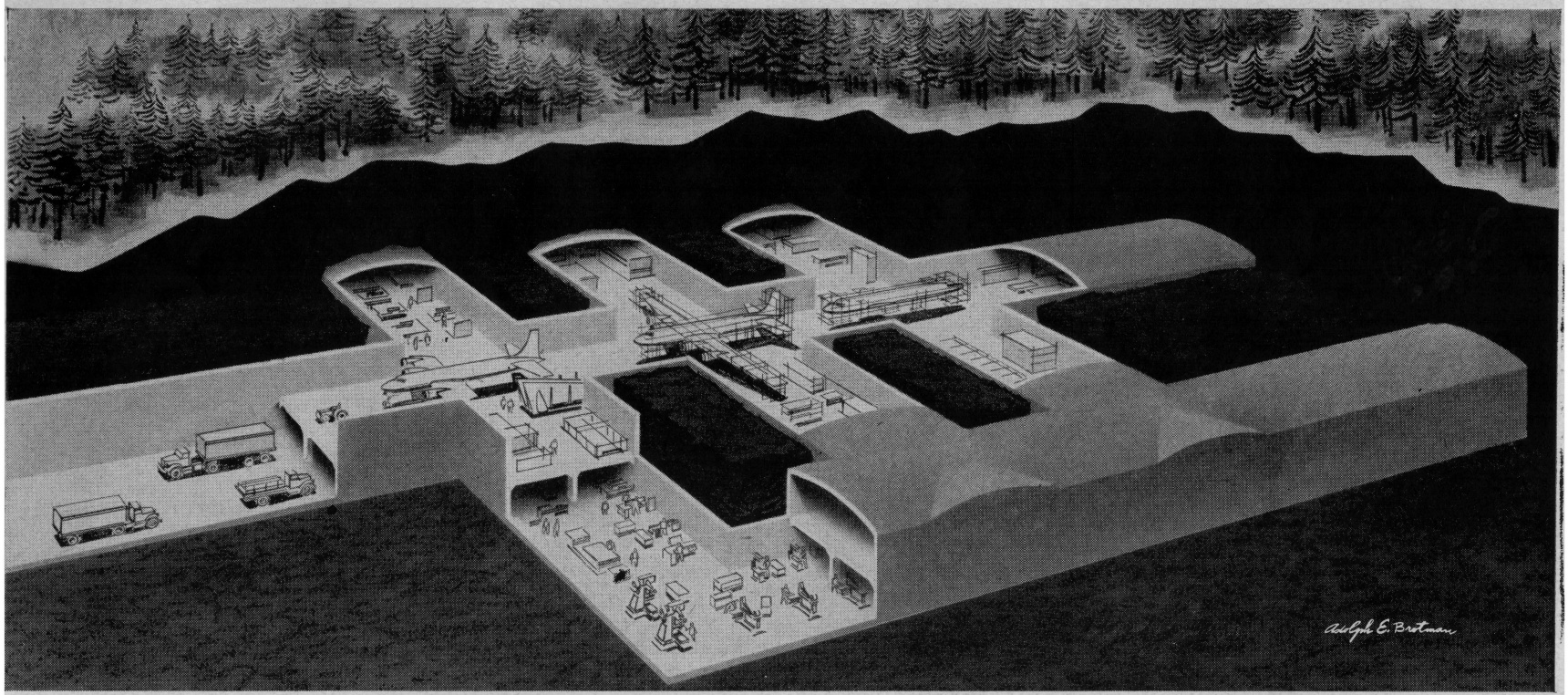
DESTROYER PEN, similar to that used by *Uppland,* is shown in an artist's drawing. Heavy steel gates and jagged shock pockets cut into the granite walls protect ships from bomb bursts outside pen.

MOBILIZATION UNDER COVER

By now the Swedish air force has rock hangars for most of its estimated 1,000 planes. The army has buried barracks, supply dumps and command posts. Navy pens can harbor subs and warships 40% bigger than the *Uppland.*

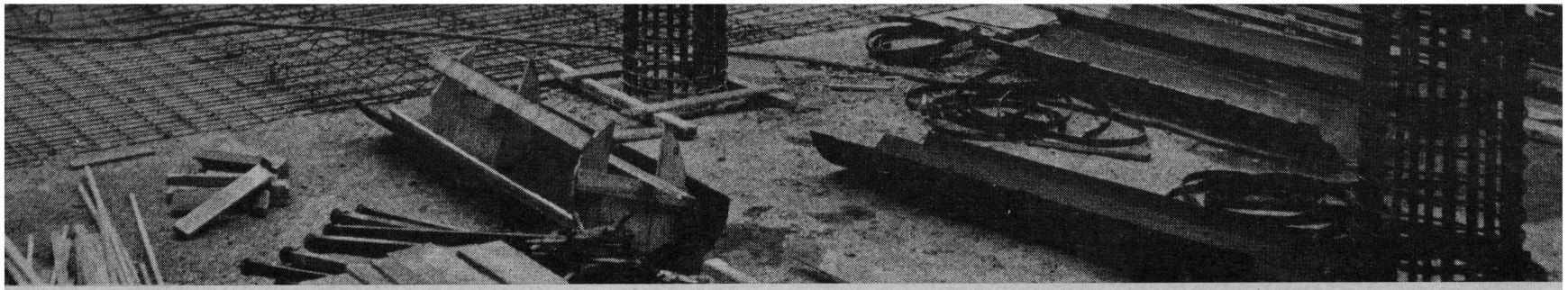
The Swedes have reaped at least two unexpected rewards from their efforts. Private industry has found that underground plants, although slightly more expensive than those aboveground, are cheaper to maintain because they are less affected by exposure. And Swedish engineers have developed a revolutionary method of rock-cutting which uses a light percussion air drill with a tungsten carbide tip. This Swedish method speeds digging by 500% and sharply cuts costs. "We've lost all our respect for hard rock," says a Swedish engineer.

JET FIGHTERS STAND READY. WHEN ORDERED TO SCRAMBLE, THE JETS ARE TOWED THROUGH A DOOR (REAR) BY TRUCKS, CAN BE AIRBORNE IN TWO MINUTES



IRCRAFT FACTORY in sketch is SAAB plant in operation at Linköping. In time conditions completed planes (*center*) would have wings disassembled (*left*) before being towed to surface. Lower level is now used for parts fabrication and assembly. Elevators connect shops below ground with main factory above.

CONTINUED

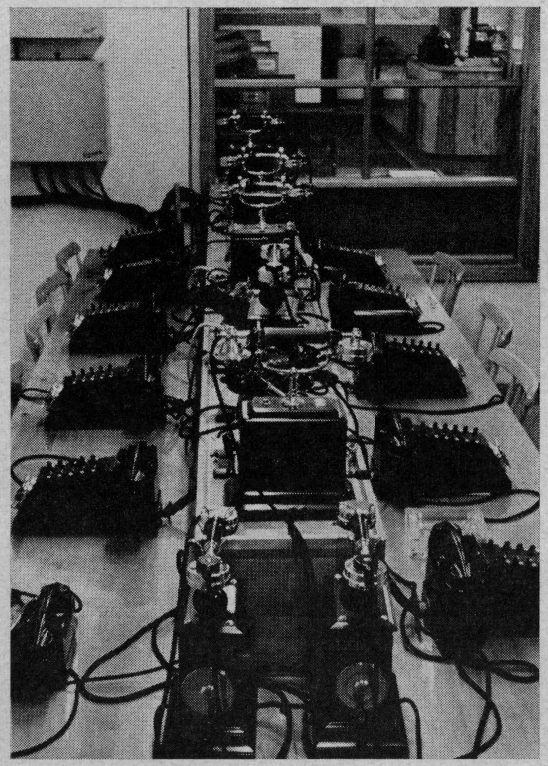


BIRGERJARLSTRAPPAN SHELTER IN STOCKHOLM TO BE FINISHED THIS YEAR WILL HAVE BEDS FOR 8,000 PEOPLE. IN PEACETIME IT WILL BE 150-CAR GARAGE

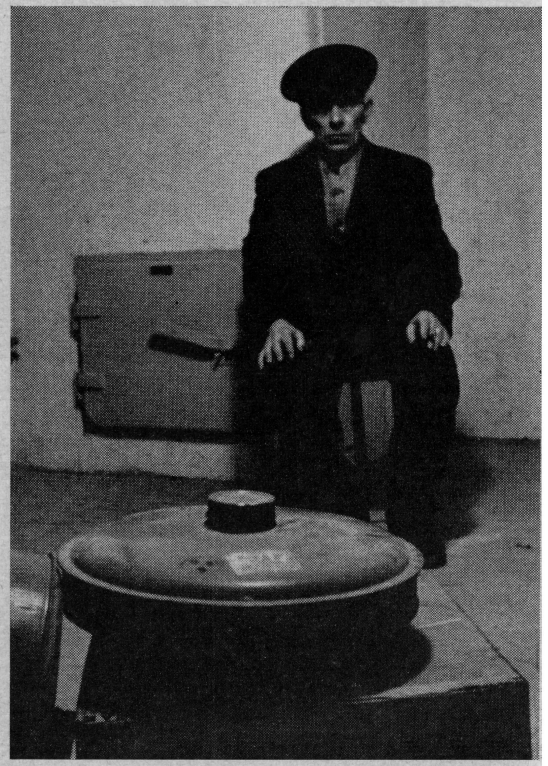
FOR EVERYONE A SAFE HAVEN

The rules of the Swedish Civil Defense program are stiff. Every able-bodied Swede between the ages of 16 and 65 who is not on active military duty must serve 40 to 50 hours his first year on civil defense and take refresher courses thereafter. Civil defense laws also provide protection for the people. A 1946 act requires that all new homes for three or more families include a bomb shelter. Huge public shelters are being excavated everywhere. "Today," says a sober Swedish official, "every man has a right to a place underground."

WINE CELLAR of state liquor board is in shelter which may be taken over by hospital in wartime.



CONTROL CENTER has switchboard which when staffed will serve a Stockholm district of 280,000.



AIR RAID WARDEN Hans Larsson rests in a small family shelter. In foreground is air filtering device

STOCKHOLM WORKERS HEW OUT SWEDEN'S BIGGEST SHELTER, KATARINA, WITH ROOM FOR

p. 64;

Fiction and reality

HERE again is the tradition of unreality. Between the two wars, France haughtily maintained her claim to being a world power. But she had no modern army, almost no tanks, no aviation, no powerful industry, no united national will, no effective government, and no political perspective other than to cling to the paragraphs of treaties. When put to the test by Germany in 1940 she suffered not just a military, but also a political and moral collapse. In 1940 the contradiction between fiction and reality was so tragically revealed that the political habits which had brought it about seemed condemned forever. The great idea—one might almost call it the obsession—of the resistance was to make a fresh start, a tremendous national effort, to give back to France not only her legal but also her moral stature.

But the Allied victory erased the memory of 1940. With the prestige and legal status of a victorious power, renewing all the old possibilities for self-satisfaction and glorious illusion, the Fourth Republic took the same road as the Third, in world as well as in domestic politics.

With this long tradition behind her, France finds it easy to pass laws but difficult to take action, even when she wants to. Today the French state is trying to build an economic structure suitable to the empire and to the role of world power to which France lays claim. This effort, maintained against winds and tides and almost behind the backs of the nation and its parliament, has tended to narrow the frightening gap between the fiction of a great power and the reality of a country that has lagged behind both economically and technically.

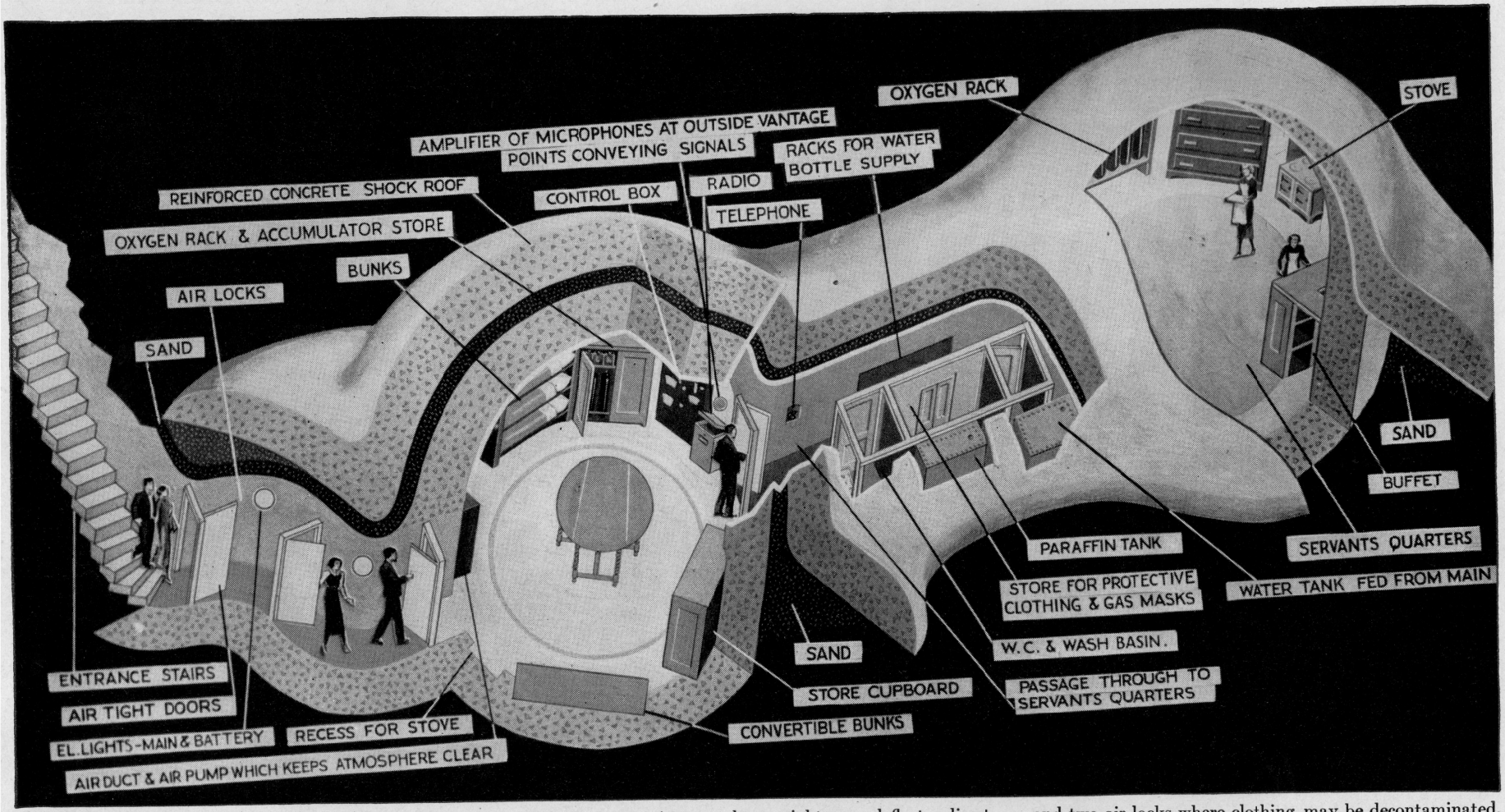
The real France has been brought somewhat closer to the fancied one in the last few years, but meanwhile the disintegration of the colonial empire has been even more rapid than the restoration of French might at home. The great illusion of World War II victory is being paid for slowly and painfully, in successive postwar defeats: the loss of Indochina, abandonment of the colonial settlements in India, Tunisian autonomy, the approaching independence of Morocco, the Algerian war, the loss of the protectorate set up in the Saar. In the course of less than two years France has seen her imperial domain shrink like magic. To maintain the remnants of the empire has required a tremendous effort, and the country is swept by a muffled revolt by those who feel that it is all in vain.

But here, too, perhaps because of the terrible lessons of Indochina, North Africa and the Saar, a change is commencing which is a sign of returning health. France seems to be learning the

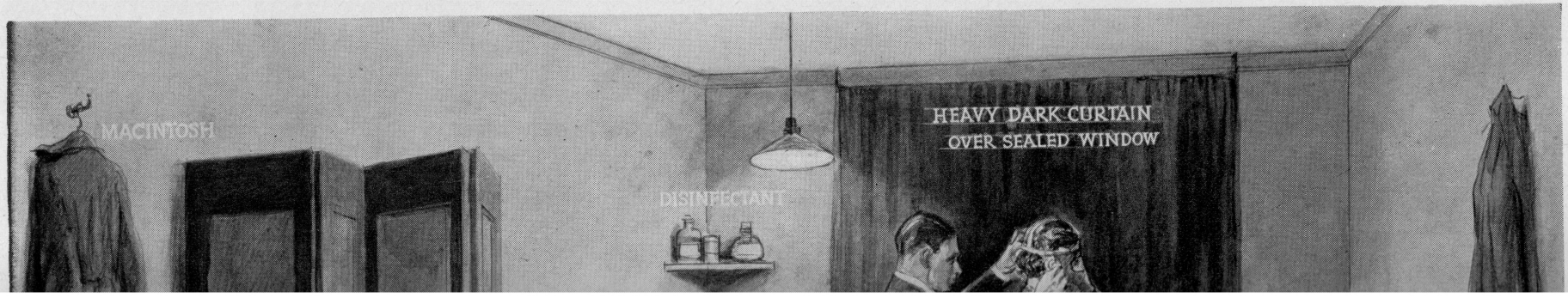
BRITAIN GOES TO WAR

SEPTEMBER 18, 1939

SPEAKING OF PICTURES . . .



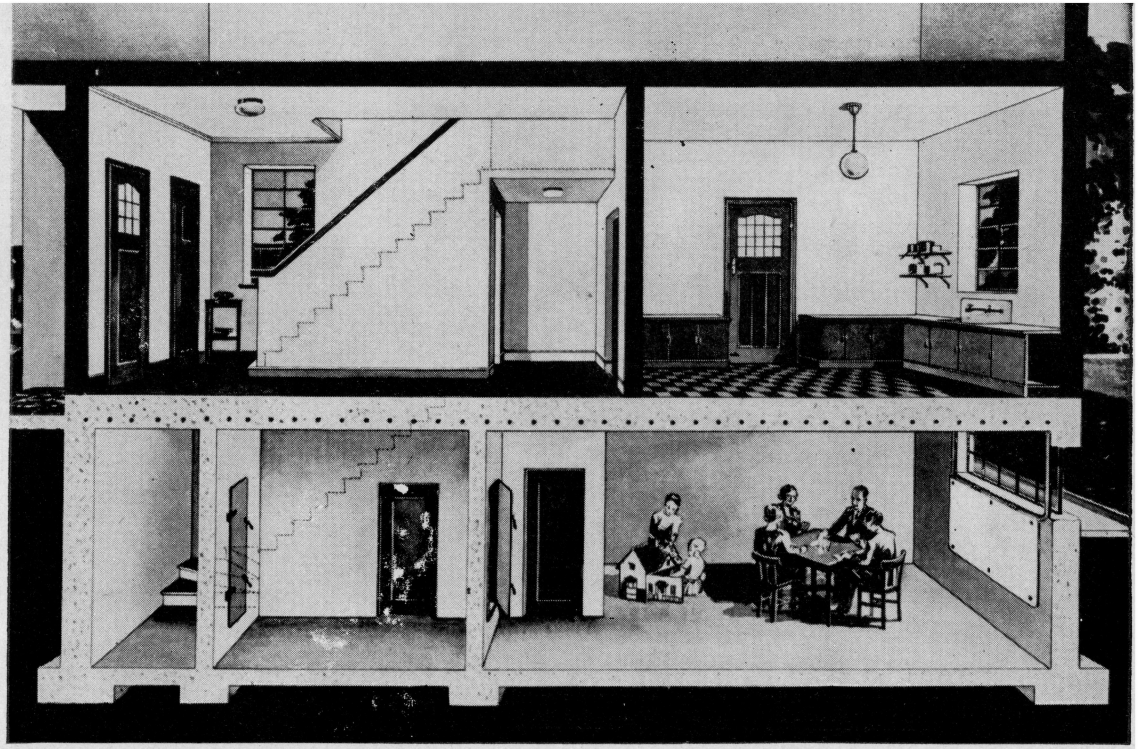
A de luxe shelter now being built at Wimbledon with servant quarters is fitted for 25 persons. Reinforced with 400 tons of concrete, its curved top might even deflect a direct hit. It is entered through three splinter-&-gasproof doors and two air locks where clothing may be decontaminated. Air duct and pump clean air, keep inside pressure up, gas out.



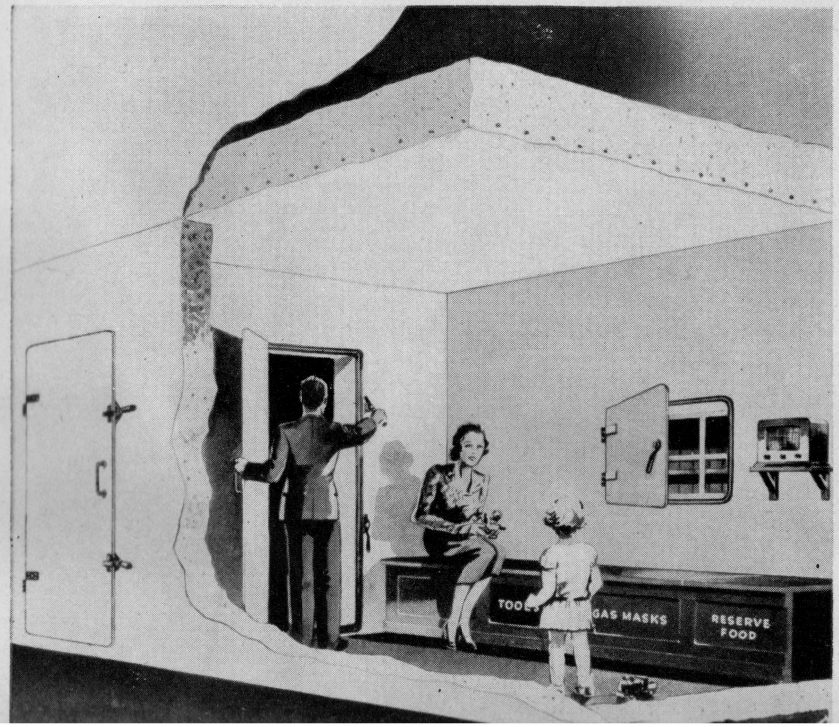
. . . MEN GO UNDER GROUND TO LIVE

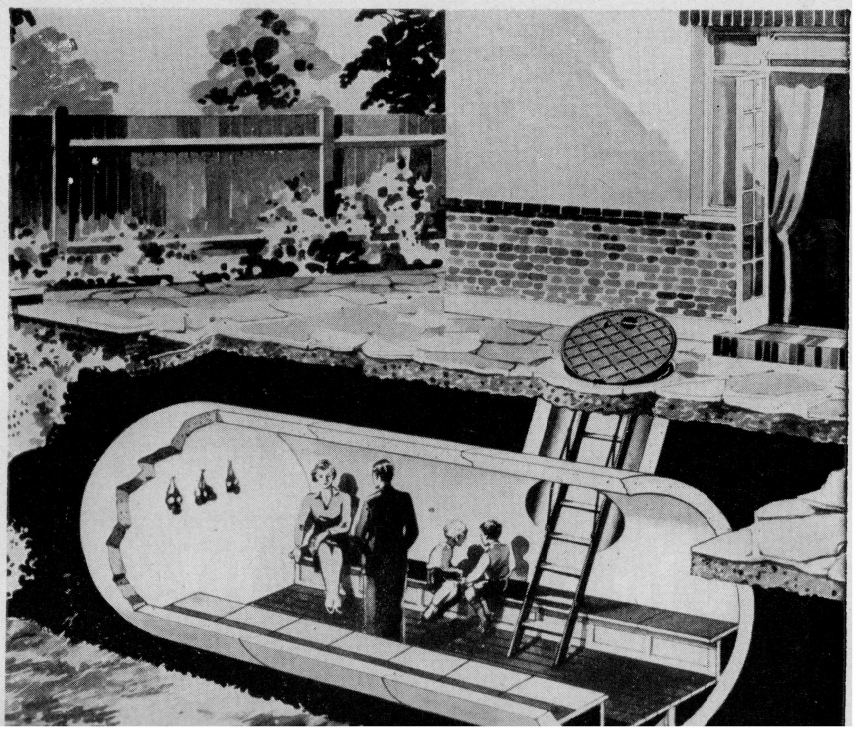
Thirty-six million Englishmen live in cities or towns where air raids are now a momentary danger. Sirens shriek at any hour of the day or night and even if enemy planes are sighted as soon as they reach the English coast, Londoners have only about ten minutes to reach air-raid shelters in safety. The outbreak of war found England with far too few public and private shelters. For low-income families (under £250) the Government has installed 1,150,000 family shelters, made of steel sections and half-buried in gardens and piled with sand. These would take care of 6,960,000 persons. They are splinterproof against 500-lb. bombs 30 ft. away but are not secure from direct hits or from gas. Other citizens, factories, offices have built their own shelters, some quite elaborate.

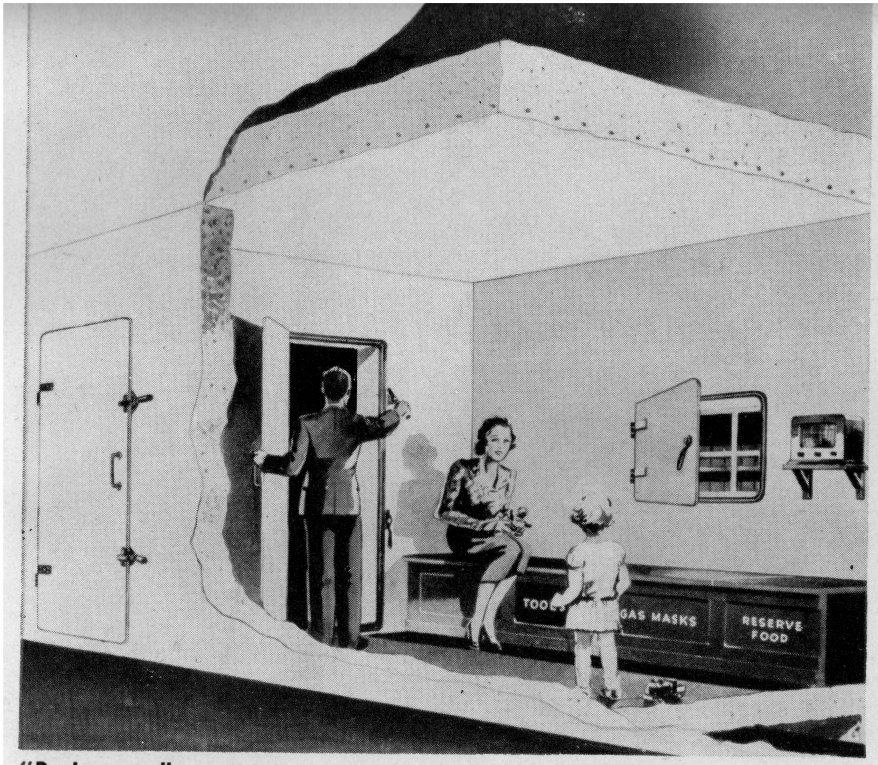
LIFE here shows some of the designs for living underground, as illustrated by Home Office bulletins and private contractors. For publicity, turn the page.



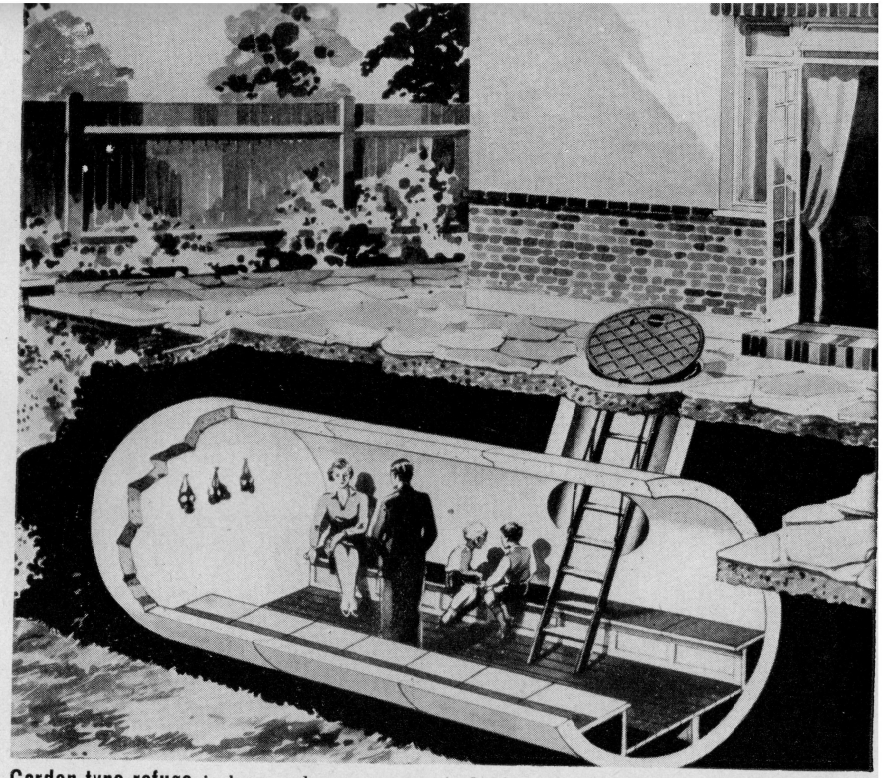
Reinforced concrete basement is included in architect's design for a new house. In raid, the window is shut tight. Recommended for easy access from house proper, basement is built to protect occupants if the house should collapse.



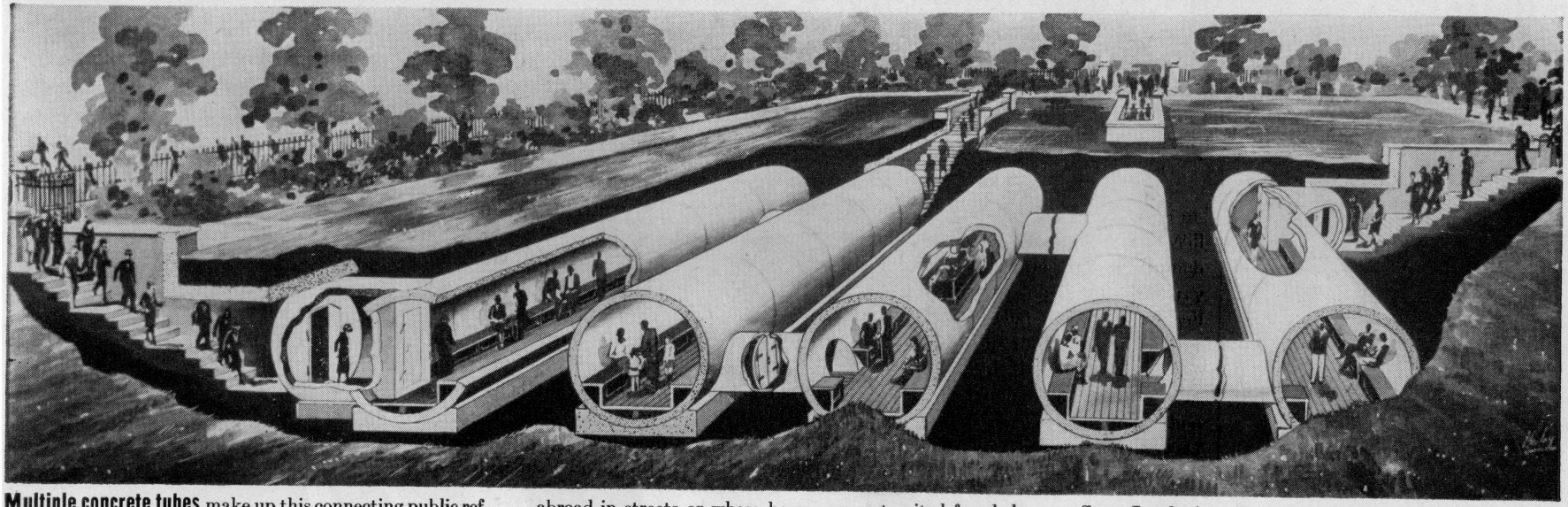




"Dual-purpose" room is the euphemistic name for this ground-floor chamber serving as a spare room or air-raid shelter. Note the chest for reserve food, medical kit and gas masks.



Garden-type refuge is best and most economical where space permits. Made of pre-cast concrete sections, entirely below ground, it is entered by air-tight manhole, lacks air lock.



Multiple concrete tubes make up this connecting public refuge for school grounds, squares (e.g. Hyde Park), for those abroad in streets or whose homes are not suited for shelters. Each tube houses only 50 people to localize explosion effect. London's public shelters suffice for 15% of the daytime population. Others must seek safety at home or work.

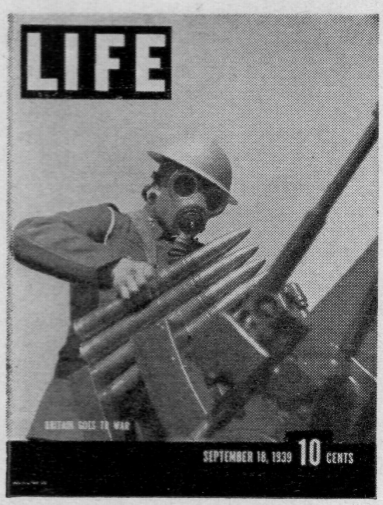
Vol. 7, No. 12

LIFE

REG. U. S. PAT. OFF.

September 18, 1939

CONTENTS



LIFE'S COVER. The gas-masked British gunner on the cover is sliding a clip of four anti-aircraft shells into the breach of a 40-mm. (1.7-in.) Bofors gun made in Sweden. This gun is for defense against low-flying planes. It is usually hand-aimed by the gun crew, though it may also be aimed by predictor mechanism. Its supersensitive shells, effective up to two miles and fired at the rate of 120 a minute, must make a direct hit on the plane to explode. These superb little guns will doubtless be manned by factory crews in British industrial areas.

Photographs for LIFE *by Carl Mydans*

Pr 65:

"The next war," said Marshal Foch after the War of 1914–18, "will begin where the last one ended."

On Sept. 3, first day of the war, the British merchant liner *Athenia* was sunk in the Atlantic Ocean off the Irish coast, torpedoed, said the British Admiralty, by a German submarine. In the first week of the war, U-boats had reportedly sunk eight British merchant ships. The U-boats were taking up where they had left off in 1918.

It would be high military folly for the Germans not to exploit their submarines to raid commerce. The plain and unforgettable fact is that submarine warfare, by the Allies' own admission, came close to winning the last war for the Germans (*see p.72*).

The submarines which the Germans use for commerce raiding are mostly coastal and sea-going boats. Roughly comparable to them are U. S. submarines of the R-class. With the Navy's co-operation, LIFE's photographer went aboard the *R 14* to take the first full picture story ever made of a U. S. submarine in operation. Since one submarine is much like all others, these pictures illustrate the workings of almost all undersea craft.

Smallest type of U. S. submarine in service, the *R 14* is 186 ft. long, displaces 530 tons—113 ft. shorter and 900 tons lighter than the sunken *Squalus*, a medium-sized submarine. The *R 14* makes 10 knots on surface, 6 knots underwater. Called a "coastal" submarine as against larger craft of the "fleet" type, the *R 14* would function in wartime to patrol U. S. waters against raiders. Unlike Germany, the U. S. Navy never uses its submarines as commerce raiders but calls on them for battle duty. They make excellent, unobtrusive naval scouts. They can harry an enemy fleet, cramp its maneuvers, force it to change tactics. In actual battle, they lie in wait while the surface warships push or lure the enemy fleet into range of their torpedoes.

Below, the *R 14* is laid bare for inspection. Atop its fishlike hull is a deck superstructure from which rises the barrel-like conning tower, topped by the bridge and periscope. When a submarine dives, as shown in the photographs at the right, its diving planes fore and aft tip forward while water is let into the ballast tanks. In the bow of the submarine (*shown on the opposite page*) are the torpedo tubes. Before firing, the grooved sections swing in, the outer doors of the torpedo tubes open. Then a jolt of compressed air starts the torpedo on its deadly track.

German U-boats almost won last war

In 1914, neither the Germans nor the Allies knew how powerful a naval weapon the submarine was. When War broke, the Germans kept its fleet of 28 U-boats (*Unterseeboote*) close to home in the North Sea, used them timidly as scouts. But in September the adventuresome *U 9* sank three British cruisers within one hour. At that point the German High Command realized what the submarine could mean and the British Grand Fleet withdrew fearfully from its Scapa Flow base to a safer harbor in Scotland.

In 1915, commerce raiding began in earnest. In 1917, the German High Command started its greatest campaign of unrestricted submarine warfare. April of that year was a terrible month for ships at sea. U-boats were sinking vessels at the rate of one every 4½ hours. One out of every four ships which left the British Isles never returned. Almost 900,000 tons of shipping were sunk that month. If the Germans had been able to keep up their furious destruction, they probably would have starved Britain into surrender. But not realizing how close to success they were, they relaxed their efforts. The Allies suddenly improved their anti-submarine defenses and, as a last resort, adopted the convoy system. It worked. The U-boat menace steadily diminished. Total wartime loss through U-boats was 11,189,000 tons, half of it British.

When the War ended, the Germans had 138 U-boats. Today they have at least 60, and 20 to 40 a-building. These make up the best underwater fleet in Europe. Though the submarine's efficiency has greatly improved since 1918, defense against it is also far more effective. Britain's merchant marine, with less tonnage than it had in 1914, is less able today to absorb punishment of submarine warfare.

p. 80 :

wife, Charles Merz, editor of the New York *Times*, played Chinese checkers.

Over the long Labor Day weekend, 22,000,000 cars drove 550,000,000 miles over U. S. roads. Nearly 200 people were killed and some 600 wounded in traffic accidents. Roughly $30,000,000 was spent on picnics, hot dogs and gasoline. In the comic strips, Dick Tracy's ex-girl, Tess Trueheart, spent her days with a demented dog fancier; Skippy became unhappily involved with an inkwell; Mr. and Mrs. passed a miserable day at a resort hotel. On a roadway north of Manhattan, a policeman commenting on the day's news to the driver of a Good Humor truck remarked, "This here uniform is oke with me."

All this was activity, which, in the U. S. last week, would have been no more noticeable than similar events in any other week save for the fact that they coincided with the start of another great European war. The word "another" was what made the start of the war at once more horrible and more unreal. If the first World War seemed incredible, the second seemed doubly so. There was in it some element of a grisly masquerade; its actions had a childishly imitative quality and its protagonists viewed from a distance were like characters playing in a nightmare some game of which they knew the rules but not the purpose.

Many things that were going on before the first World War continued to go on during it; and many things that started during the War continued to go on after it. There was however a deep change in the way that people experienced all things—a change expressed most simply by the fact that since 1914 "before the War" and "after the War" have been familiar phrases, all over the world. When Europe went to war again last week, these phrases became suddenly meaningless. Like a grandfather's clock marking the hours, the guns in Poland and along the Rhine, sounded a new interval of time in the century. Superficially, nothing in the U. S. changed much except the prices of stock, the prices of food, the number of people who listened to the radios. Actually everything was changed.

Whatever its effect upon the U. S. imagination, World War No. 2 seemed sure, like World War No. 1 to mark the end of an epoch. And the trivial aspects of that epoch—the sun over Kansas cattle, Dewey in Plattsburg, Good Humor trucks on the summer roads—acquired suddenly a strange importance. Against the background of war, they emerged sharp and impressive, like a conversation prolonged in the theater after the rising of the curtain or like a familiar landscape made clear by lightning in the summer night.

U.S. NEWS® & WORLD REPORT

APRIL 9, 1984 $1.75

Uncle Sam to Deadbeats: We're on Your Tail

Help on the Way for 35 Million Allergy Sufferers

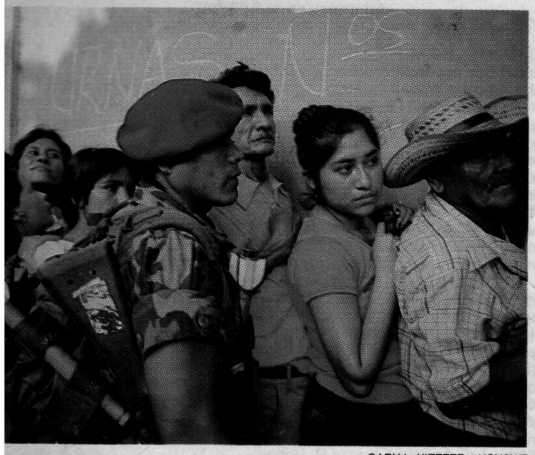
What Next?

A World of Communications

U.S.NEWS & WORLD REPORT

VOL. 96 No. 14 April 9, 1984

24

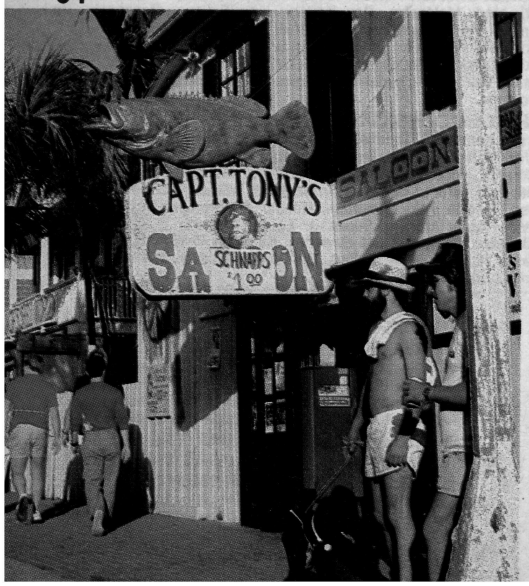


GARY L. KIEFFER—*USN&WR*

29

39

64



Cover illustration: Richard Krepel

 U.S.News & World Report (ISSN 0041-5537) is published weekly, except two issues combined at year-end, $36 per year, by U.S.News & World Report, Inc., 9465 Wilshire Blvd., Beverly Hills, Calif. 90212. Principal office: U.S.News Building, 2400 N Street, N.W., Washington, D.C. 20037. Second Class postage paid at Beverly Hills, Calif., and at additional mailing offices. POSTMASTERS: Send Form 3579 to U.S.News & World Report, P.O. Box 2624, Boulder, Colo. 80302.

Nuclear Arms Make Chance of War "Far More Remote"

Would nuclear disarmament make the world safer? Will the arms race inevitably lead to war? No, answers an authority in a challenge to much of today's conventional wisdom.

Interview With Michael Howard, Expert on Military History

Q. Professor Howard, in historical terms, how has the development of nuclear weapons affected the basic nature of war?

A I would put it this way: Wars don't just "happen"; people *make* war—and they do so when they think that this provides them with a better option than not making war. In the "good old days" of conventional forces, it was not too difficult to visualize circumstances in which one might emerge from a war in better shape than one went in. Or, more often, circumstances when if you did *not* go to war, you would be in even worse shape than if you did.

With nuclear weapons, the whole balance of cost and benefit has been radically tilted; at least if there is the slightest prospect that these weapons are going to be used against oneself. For most countries—even continental-scale powers like the United States and the Soviet Union—any use of nuclear weapons against one's own territory would be a catastrophe beyond imagining, a man-made disaster far surpassing anything that has happened to mankind before. Hiroshima and Nagasaki give one only a glimpse of it.

The prospect of this happening is a profound and unprecedented deterrent against making war. That is why I am not in favor of the total abolition of nuclear weapons.

I think that the development of nuclear weapons has given us a chance for the indefinite future of preventing the outbreak of major war, at least between powers armed with nuclear forces. One can't say, of course, that it will never happen. But I think that the possibilities of major war are far more remote as a result of the existence of nuclear weapons than they ever were in the past.

Q. Do you think the nuclear-arms race is beneficial?

A Certainly not. I said that I did not think that the abolition of nuclear weapons would in itself make the world a safer place. In fact, I find it very difficult to conceive of the circumstances under which these weapons could be "abolished" and stay abolished.

Even if a fully verifiable treaty were signed whereby all nuclear powers proceeded to abandon their nuclear stockpiles, they still would be armed with conventional forces. And with conventional forces alone there would be a greater possibility that these powers might one day regard war as a reasonable option.

Once that happened, once the erstwhile nuclear powers got into a conventional war, they would quickly embark on a race to redevelop nuclear weapons, and you would be in a nuclear conflict before you knew where you were. So I think the abolition of nuclear weapons could be counterproductive from the point of view of peace. The real problem is not disarmament but how to control nuclear weapons.

Q. What can be done to control these weapons?

A There are two things that one must strive for. The first is the kind of arms balance that is not destabilizing, and the second is arms postures that are not ruinously expensive.

Q. Can you draw any conclusions from history about the fear that a continuing arms race will inevitably lead to war?

A Well, there have been wars which have been preceded by arms races. But there've been many wars which have *not* been preceded by arms races, and there've been many arms races which haven't led to wars. So you cannot say, as a generalization, that arms races always lead to wars. They don't.

Q. Do you find any difference between the Soviets and Americans in their attitude toward the use of nuclear weapons?

A One has to look at this on different levels. At the general popular level, there is on both sides an appalled horror at the idea of war. It may indeed be stronger in the Soviet Union even than it is here, for the obvious reason that they had war fought on their own territory within living memory, between 1914 and 1945. It will take a long time for that to grow out of their corporate memories.

Then, at the top level, where decisions are taken, I think you would find the same great horror at the dangers of a war even worse than any they have experienced, and as a result an extreme reluctance to provoke one.

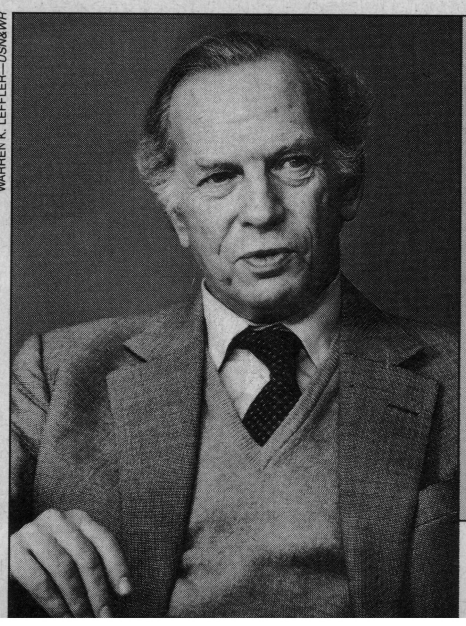
At the level of the military experts, however, the Soviet Union does have a very explicit doctrine for fighting and, if possible, winning a nuclear war. The American armed forces, to the best of my knowledge, have not produced such a doctrine, so at that level there is a major difference. The hawks in the United States can produce a great deal of very alarming Soviet military literature which suggests that the Soviet Union believes it can win a nuclear war. In fact, what it shows is the Soviet armed forces are making plans as to what to do if they do have to fight.

Q. Does that imply the Soviets might contemplate nuclear war to achieve their objectives in certain circumstances?

A All the literature that I've seen quoted comes from Soviet military textbooks. This is straightforward thinking by professionals on what to do if they have to. I have not seen anything at the political level that indicates that Soviet statesmen regard nuclear war as a means of attaining national policy except, as in our case, in extreme circumstances to safeguard their national independence.

Q. Have there ever been developments in weaponry—say the invention of gunpowder—that had an impact on the conduct of war comparable to the impact of nuclear weapons?

A Well, certainly not

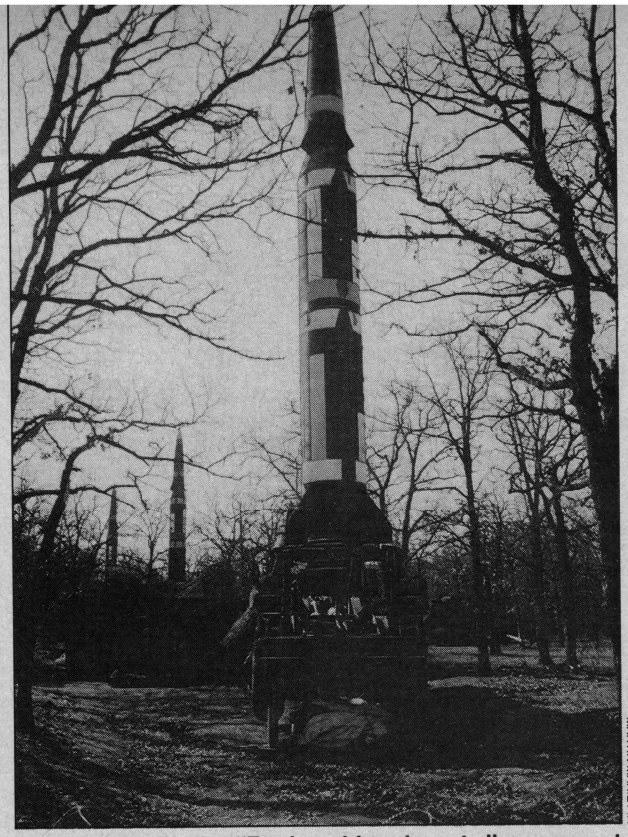


WARREN K. LEFFLER—*USN&WR*

Michael Howard, Britain's foremost military historian and an internationally recognized scholar, is Regius Professor of Modern History at Oxford University. A decorated veteran of World War II, he has devoted 30 years to war studies and is author of many works on the subject, including *Studies in War and Peace* and *Causes of Wars.*

the invention of gunpowder, because that took the best part of three centuries to become effective on the battlefield or anywhere else. You have to turn to the 19th century for any comparable technological leap. This was in the field of naval warfare with the development of three combined technologies—the steam engine, which led to screw-driven men-of-war; the development of ironclads and then steel construction, and the development of breech-loading rifled artillery.

The transition within a single generation, as a result of these developments, from the battleships of Nelson to the battleships of von Tirpitz is the nearest comparison one can draw with the advent of nuclear weapons. There was much the same sense of bewilderment on the part of the unfortunate sailors as one finds now with respect to nuclear weapons. They asked the same kind of question as we do: "How are we going to fight with this new and largely untested technology? And if our enemies have these weapons and we do not, then there's no point in putting a fleet to sea at all; it'll just get blown out of the water."



MARTIN MARIETTA

Pershing 2 missile. "Real problem is not disarmament but how to control nuclear weapons," says Howard.

But even that technological transformation bears only a very faint resemblance to the transformation caused by the introduction of nuclear weapons.

Q. There are some political scientists in this country who use computers to try to figure out where war is most likely to occur and what factors are most likely to cause wars. Does history offer a clue to those questions?

A The trouble with many social scientists is that they regard war as a "thing in itself" that can be isolated from all other human activity. In fact, it is not a "thing" that happens: It is something which people do—an activity that cannot be divorced from its context. It's like crime or marriage or divorce.

If one can, with computers, analyze the various reasons why marriages break up or why certain kinds of crime dominate in some areas and not in others, I suppose you can do the same with the incidence of war. But once you have these statistics, I don't know what you do with them. Statistics about divorce do not do much to stop marriages from breaking up.

Q. So you don't think we can come up with general principles about the cause of war in order to help avoid it?

A Not much more than has already been said by people like Thucydides or Machiavelli or Francis Bacon or Thomas Hobbes or the many wise men in the past who simply looked around and observed their environment. They certainly came up with important insights. For example, states often go to war, not when they are aggressive but when they're frightened; they see power ebbing away from them and are afraid if they do not assert themselves now, they will never have another opportunity. That was an observation made by Thucydides over 2,000 years ago.

Really great wars usually start not from specific rivalries about, say, economics or possession of territory. They start because one side sees the other getting an edge of power which is likely to grow greater with time. Britain went to war with Germany in 1939 not because we had any more affection for the Poles than we had for the Czechs, for whom we had *not* fought in 1938, but because we felt if the Germans were not stopped then, it would be impossible to stop them later. In the same way, the Germans went to war in 1914, among other reasons, because they saw Russia getting more powerful, and if they did not destroy their military power then, they would never be able to do it. But there are other causes involved in both those wars. Most wars in fact—like most divorces or most crimes—have multiple causes.

Q. If war is part of human nature—like marriage and crime—is nuclear war inescapable?

A I don't think that war is inescapable—any more than divorce is inescapable. Indeed it is an activity which has grown steadily less common. Before, say, 1500, there's no point in trying to tote up statistics of wars in Europe; war was endemic. It was a means of asserting virility or defending rights, something between sport and litigation. Europe was a war-making society.

Since then, society has developed in a manner that has made this less and less true—certainly of Europe and of most other parts of the world as well. Wars have become more discrete, finite, managed, deliberate: Still used by states for the attainment of political objectives, but increasingly rarely. When they happen, they are more terrible; but for that very reason people resort to them—most people, that is—with increasing reluctance. The incidence of major war has decreased, and I think that the introduction of nuclear weapons is a powerful reason why it is likely to continue to decrease.

Still, it would be ridiculous to say that this trend has reached a point at which major war will never occur again or confidently assert that there will never be a war in which nuclear weapons are used. One cannot rule it out as a possibility, but our very dread of nuclear war makes it a highly improbable possibility.

Q. Finally, Professor Howard, would the lessons of history suggest that the 35-year-old North Atlantic Treaty Organization is entering senility and does not have long to survive?

A Here I find myself schizophrenic. As a historian, I have to admit that 35 years is a long time for any alliance to hold together; one should be surprised, not that it has problems, but that it survives at all under circumstances so very different from those in which it was founded. But as a political observer, and indeed participant, I devoutly hope that it will last my time, since I cannot believe that its disintegration could possibly contribute to the peace and stability of the world.

The need for the alliance—if only as a stabilizing factor within the Western European political system—is as great as ever. If the United States were to announce that it intended to pull its troops out of Europe in five years and that the Europeans must develop their own defense system, the political impact, on West Germany in particular, would be devastating—as indeed would be the case everywhere in Europe—perhaps East as well as West. You could say that Western Europe is one area where American forces really are doing a very effective peacekeeping job.□

How the Soviet Elite Takes Care of Its Own

Pensions, limousines and prized ballet tickets. These are just some advantages of having high-placed kinfolk.

MOSCOW

To get ahead and stay ahead in the Soviet Union is not just a matter of talent and ambition. It also helps to have a close relative who is—or was—a big shot in the Soviet hierarchy.

There is an unspoken axiom in Moscow's ruling circles: The Communist elite—the New Class as it is called—takes care of its own. And that applies to the kin and associates of former leaders who have died, retired or been ousted.

It was not always so. After Lenin died in 1924, Joseph Stalin liquidated Lenin's allies, whom he considered enemies. Upon Stalin's death 29 years later, Nikita Khrushchev got rid of Stalin's closest henchmen.

But all that has changed. Leaders today realize it is prudent to deal generously with intimates of their predecessors. The day will come when they also will relinquish power. No one wants to revive a dangerous precedent.

Thus, Igor Andropov and his sister Irina, children of the late President Yuri Andropov, can look forward to comfortable lives—assuming they continue to perform their jobs in an able fashion under the new Soviet leader, Konstantin Chernenko.

AP

Andropov's family at his funeral. Daughter Irina, widow Tatyana and son Igor are assured of comfortable lives in the future.

Igor, an up-and-coming diplomat, is a member of the Soviet delegation to the East-West disarmament conference in Stockholm. Irina is a deputy editor of *Muzikalnaya Zhizn* (Musical Life).

Their mother Tatyana Andropova receives a lifelong pension, Moscow apartment, country house, chauffeured limousine, first-class medical treatment with Western medicines and such incidental services as food deliveries, help in obtaining theater tickets and transportation throughout the country.

Brezhnev breaks tradition. Leonid Brezhnev was the first Soviet boss to move delicately against his predecessor's kin after he ousted Khrushchev in a Kremlin coup in 1964.

Son Sergey Khrushchev still works as an aeronautical engineer. Daughter Rada continues as deputy editor of *Nauka i Zhizn* (Science and Life).

When Khrushchev fell from power, his son-in-law Alexey Adzhubey was dismissed as chief editor of *Izvestia*, the government newspaper, and given an obscure post on a monthly magazine.

Nevertheless, he vacations in the Baltic republics and owns a roomy country house. Now, 20 years later, he has earned a measure of rehabilitation by publishing for the first time under his own name a memoir of his meeting with President John F. Kennedy in 1961.

Khrushchev and his wife Nina Petrovna lived out their lives in a country *dacha* guarded by police. But the Communist Party gave him only a tap on the wrist when his tape-recorded recollections were smuggled to the U.S. for publication in 1970. Khrushchev's major complaint in forced retirement was that none of his former colleagues would visit him because of his disgrace.

Brezhnev's playing by New Class rules paid off for his family when he died in 1982 and Andropov took over.

His wife Viktorya Brezhneva lives in obscurity but with full privileges. Son Yury continues as first deputy minister of foreign trade. He was decorated by the Soviet government in March, 1983, for promoting Soviet trade.

Daughter Galina, who came under a cloud when her boyfriend "Boris the Gypsy" was mixed up in a diamond-smuggling affair, works in the archives of a government ministry. Son-in-law Lt. Gen. Yury Churbanov is first deputy minister of internal affairs.

Most of Brezhnev's personal aides were retired on pensions. But Andropov named one as ambassador to Fiji and hired another as a foreign-affairs expert.

Ranking officials who fall from grace no longer are executed as in Stalin's day. Yet there can be reprisals.

Probably the most dramatic punishment was that meted out by Khrushchev to the "antiparty group" that tried to oust him in 1957. There were no trials. Yet Foreign Minister Vyacheslav Molotov was sent to Mongolia as ambassador and Politburo member Georgy Malenkov was assigned to run a hydroelectric-power station far from Moscow in Kazakhstan.

Lenin's legacy. Origins of the New Class go back to Lenin, who passed out privileges to a favored few in hopes of constructing a cohesive ruling clique. Today, special status still is the cement that holds that political elite together.

As the *elita* acquire a taste for Western ways, they develop a feeling of superiority. They are cautious in political matters. In their personal lives, they try to accumulate private wealth.

A major problem for any elite family is how to guarantee a lasting privileged lifestyle for their children.

The first step is to get the right education. Moscow has *spets-shkoly*—schools with advanced training in languages and science that favor the New Class. The second step is to get a good job. That is where a high-ranking father's role comes into play.

Chernenko's daughter Yelenva works at the Institute on Marxism-Leninism. Son Vladimir is with the film agency Goskino. Foreign Minister Andrei Gromyko's son heads the Institute on Africa as a member of the Academy of Sciences.

A third step toward a lasting good life is a foreign assignment and/or national recognition. Again, a father's influence is important. Sergey Khrushchev received a Lenin Prize and a Hero of Socialist Labor award while his father ruled the Kremlin.

The Communist Revolution changed much in Russia, but it failed to erase the perquisites that family influence can bring. Today, that influence and membership in the New Class are preserving a privileged way of life for the elite. □

By NICHOLAS DANILOFF

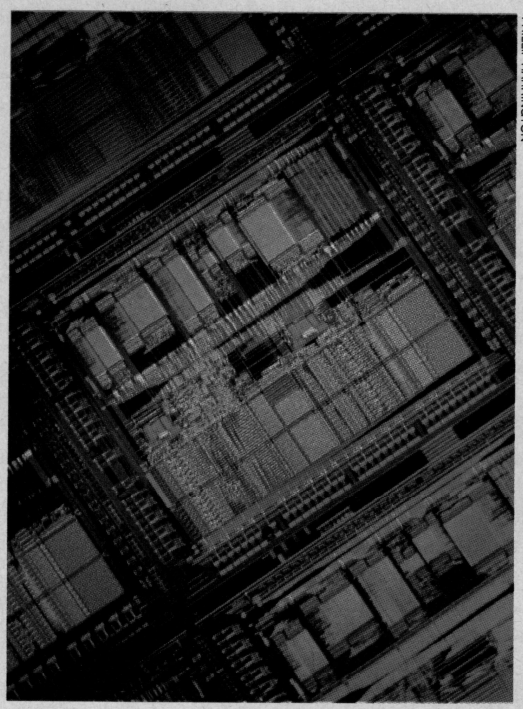
WHAT NEXT?

A World of Communications Wonders

A phone in every pocket, a computer in every home: That and more await consumers as astonishing Information Age techniques start to pay off.

A global telecommunications revolution is poised to bring astonishing changes to virtually every American—especially anyone who picks up a telephone, switches on a television set or logs on to a computer.

Growing out of the marriage of communications links with modern computers, the new technologies are spreading lightning fast. Experts say that the upheaval won't end until anyone anywhere can reach out and touch anyone else—instantly and effortlessly—through electronics.



PHILLIP HARRINGTON

Microcircuits spur computer advances.

Among the extraordinary possibilities in store for consumers by the end of this century:

- The standard telephone console will become the only computer terminal most people will need. Text and pictures will be viewed on a video screen attached to the phone, and additional data will be delivered as electronically synthesized speech. Phone users also will be able to see who is calling before answering.
- Automobiles will have not only telephones as standard equipment but also satellite navigation devices to pinpoint a vehicle's location and guide the driver to any destination.
- Combining laser optics and computers, three-dimensional holographic images will bring TV features from football games to political debates into living rooms with almost lifelike clarity.
- Automatic-translation devices will allow people to insert a text in English and have it delivered in minutes to a distant point in Japanese, Arabic or one of many other languages.

Such feats, some of which still are in the drawing-board stage, now are considered feasible by scientists who have seen the pace of communications technology move ahead dramatically in recent years.

"We are seeing a technological watershed—a sweeping away of long-established traditions and the opening of enormous business opportunity," says Charles Lecht, chairman of Lecht Sciences, Inc., a communications consulting firm in New York City. "State-of-the-art technology that once would have lasted 30 years is becoming obsolete almost as soon as it is installed."

Already, the conduits of yesterday—copper wires, radio signals, ground antennas and even electricity itself—are giving way to glass fibers, microwaves, satellites, laser beams and the pulsating digital language of computers.

The economic potential of such unprecedented changes in communications technology is practically limitless: Sales of hardware alone reached 60 billion dollars in 1983, according to estimates by Arthur D. Little, Inc., and will grow to 90 billion annually by 1988.

Added to that will be fees for communications services and software development that will add at least 50 billion dollars a year by the end of the decade.

The international stakes are enormous: Such American giants as AT&T, GTE, MCI Communications and Rolm—plus hundreds of smaller firms and entrepreneurs—are in all-out competition with experienced manufacturers in Japan and Europe.

Like a summer vine that shoots out in every direction without discernible pattern, the telecommunications grid also is spreading uncontrollably. Never before have so many individuals and organizations been able to interact on such a vast scale. By the end of the century, electronic information technology will have transformed American business, manufacturing, school, family, political and home life.

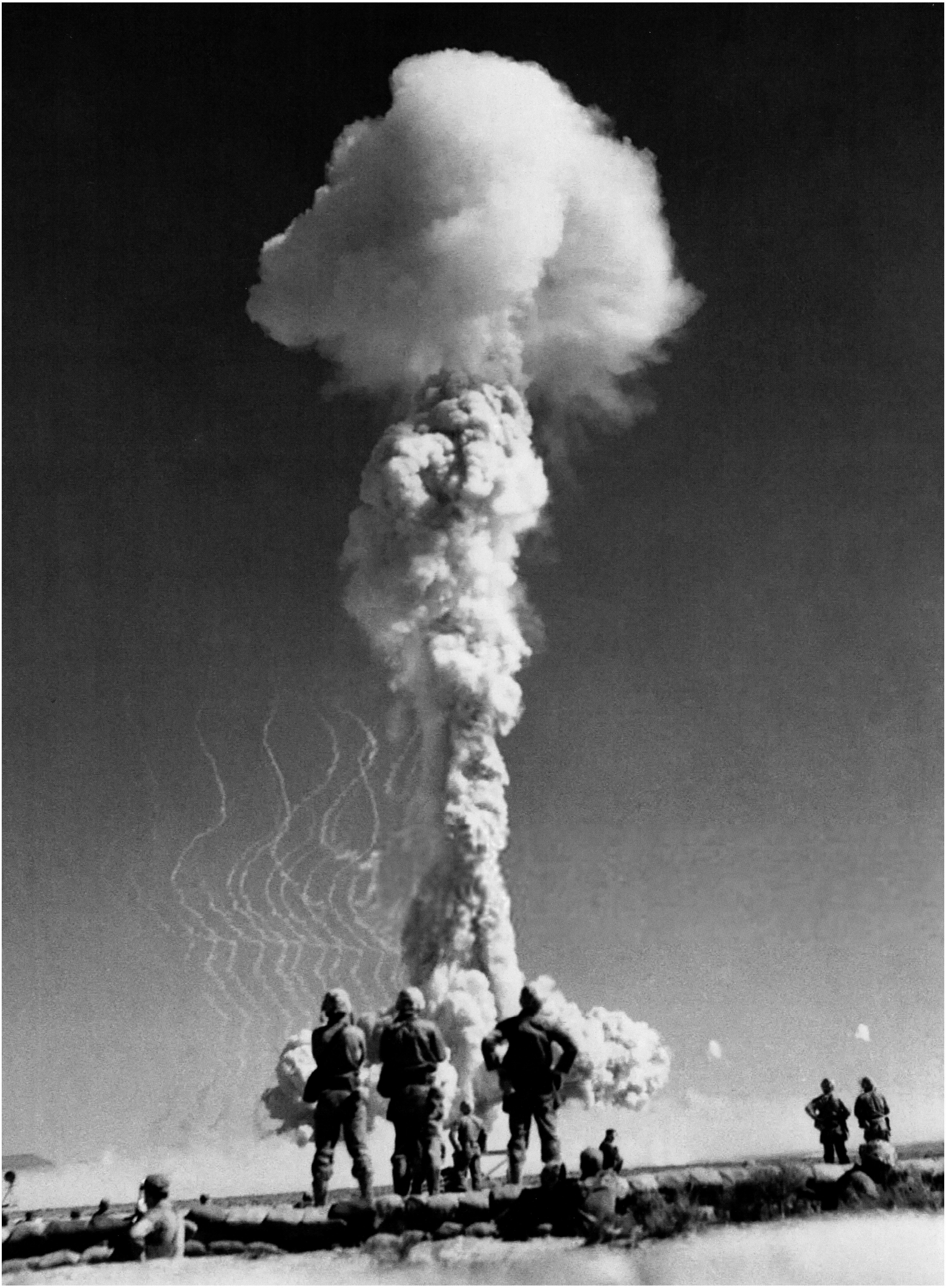
"No one anticipated how fast the demand for communications technology has accelerated in the last three or four years," says William McGowan, chairman of MCI Communications Corporation. "Telecommunications is one business today in which you don't need losers to have winners. There is enough for everybody."

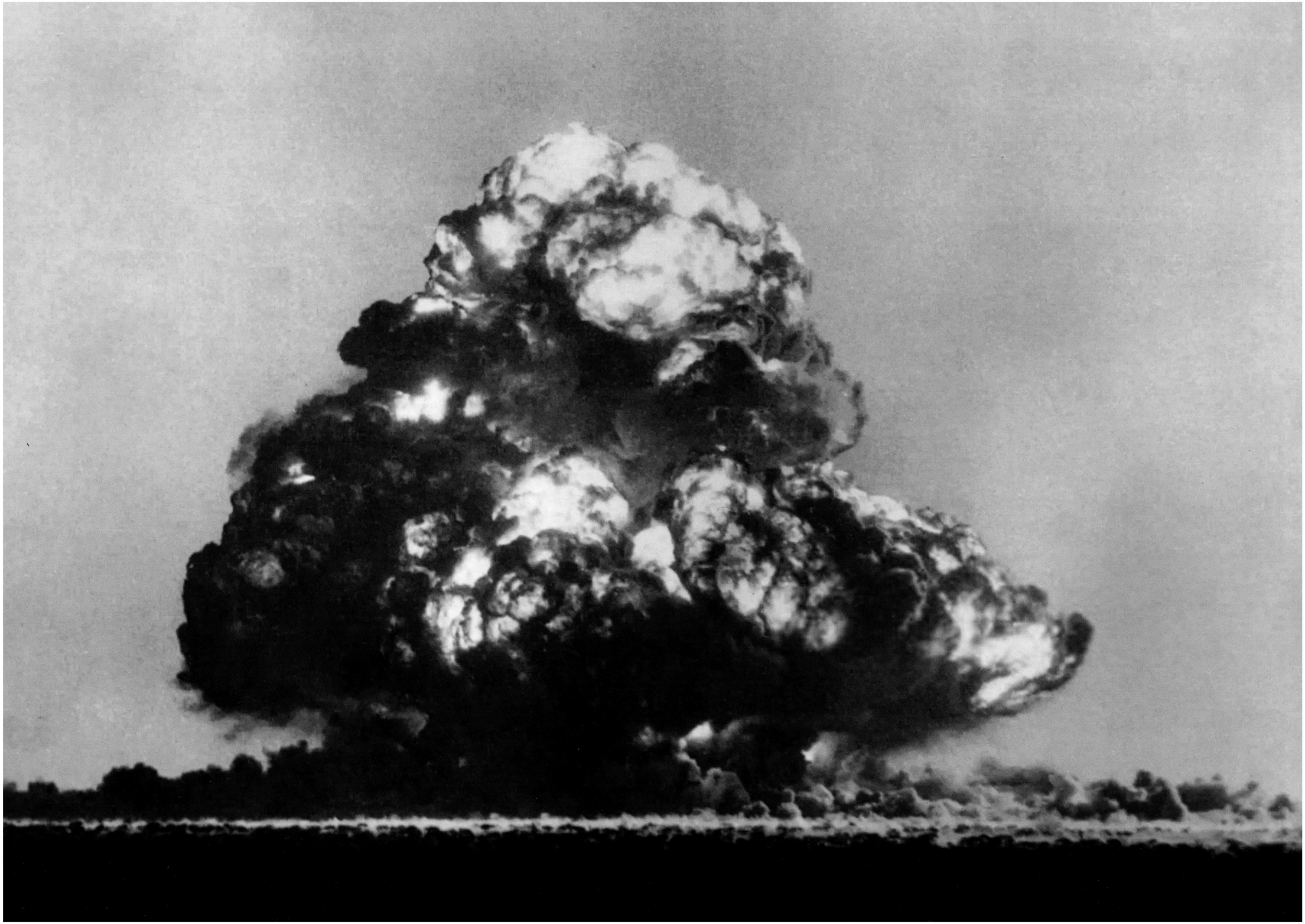
The instruments in this sweeping electronic upheaval—computers, electronic links and video technologies—are the interlocking parts of a communications network undreamed of only a decade ago.

"Even five years ago, I would not have predicted in my

Laser beams, carried on glass fibers, are speeding data and voice connections.

DAN McCOY—RAINBOW





OTW 11

CONFIDENTIAL

THIS DOCUMENT IS THE PROPERTY OF HER BRITANNIC MAJESTY'S GOVERNMENT, and is issued for the information of such persons only as need to know its contents in the course of their official duties.

Any person finding this document will hand it to a Military Office or Police Station for its safe return to THE UNDER SECRETARY OF STATE, THE WAR OFFICE, LONDON, S.W.1, with particulars of how and where found.

THE UNAUTHORIZED RETENTION OR DESTRUCTION OF THE DOCUMENT IS AN OFFENCE UNDER THE OFFICIAL SECRETS ACTS OF 1911-1939.

26/GS Trg Publications/2389

THE CORPS TACTICAL BATTLE IN NUCLEAR WAR

1958

CONDITIONS OF RELEASE

1. This document contains United Kingdom classified information and is disclosed only for official use by the recipient Government.
2. Disclosure in any way, including to another Government or by release to the Press, would be a breach of these conditions.
3. This information must be safeguarded under rules designed to give the same standard of security as that maintained by Her Majesty's Government in the United Kingdom.

Prepared under the direction of the Chief of the Imperial General Staff

THE WAR OFFICE,
April, 1958

CONFIDENTIAL

THE CORPS TACTICAL BATTLE IN NUCLEAR WAR

FOREWORD

The time has now arrived when the quantity and quality of nuclear weapons becoming available on the battlefield impose a necessity for completely new tactical methods.

These are weapons of a new order, and minor adjustments in outlook are no longer sufficient. We shall not find the solutions to the problems of nuclear battle by adapting ideas which were successful in conventional war because we shall not experience those conditions again if nuclear weapons are used.

The reasons for issuing this pamphlet are twofold:—

Firstly, because it is necessary for all of us to study these problems from a broad common basis ;

Secondly, because such a study should give rise to constructive ideas which will assist in developing the best possible tactical doctrine on which to base our policy for the organization and equipment of the Army for nuclear war.

The doctrine put forward in this pamphlet contains fundamental changes in thought and in approach to battlefield dispositions. However it is neither desirable nor sensible to be dogmatic where tactics, particularly future tactics, are concerned. At this stage there still remains plenty of scope for the development of ideas. For instance, Section 5 dealing with the counter-offensive phase is in outline only and there is need for further study here. Additional consideration of such problems as tactical intelligence, including target acquisition, control of nuclear fire, warning systems, etc, is of first rate importance. It is therefore the intention that this pamphlet should stimulate further thought and discussion at all levels.

Experience gained by study periods and exercises designed to examine this doctrine will prove invaluable in ensuring that our thought is related to both contemporary and future trends. The result of such studies when laid before the War Office Committee for the Study and Formulation of Tactical Doctrine will be of the greatest assistance in overcoming any tendency to rigidity in outlook, and in developing ideas and techniques in step with scientific advances.

Concepts which thus emerge will be reflected by the future elaboration of this pamphlet which is now in its first edition and which is in loose-leaf form so that future doctrine can be incorporated without difficulty as time goes by.

THE CORPS TACTICAL BATTLE IN NUCLEAR WAR

SECTION 1.—INTRODUCTION

1. The purpose of this pamphlet is to establish a tactical doctrine on which the corps nuclear battle will be based. It aims at covering a situation which would arise should nuclear war occur within the next five years; but future trends in weapons and equipment beyond this time frame exert their influence on today's approach to the problem and must therefore be taken into account.

2. The geographical area of operations is not specified, and the frontages and depths envisaged are not related to a particular theatre.

3. It is assumed that the nuclear weapons to be employed are those in service now, ie, 280-mm gun, HONEST JOHN (free flight rocket) and CORPORAL, and the improved versions which will supersede them.

4. It will be clear from a study of this pamphlet that, in the nuclear battle, tactical mobility is essential for success both in attack and defence. This cannot be fully achieved until a substantial proportion of the infantry is mounted in armoured personnel carriers, or at least in cross country vehicles provided with thermal protection. Meanwhile the new tactical doctrine will be applied in so far as existing equipment permits.

5. The administrative implications and the logistic background required to support the tactical doctrine are not considered here. These problems are being examined and will form the subject of a separate pamphlet. It can, however, be stated now that forward troops will not in the future be able to depend on smooth running land lines of communication. The trend will be towards pre-stocking, reducing requirements and, in emergency, air supply to specific formations. Whilst it will not be possible for air supply totally to supersede land supply, it will be most undesirable that a brigade group should ever be forced to consider withdrawal on account of a threatened land line of communication.

6. In assessing assistance from Air Forces it must be remembered that during the early stages of battle, the role of the Tactical Air Force will be to support theatre air strike forces by nuclear and conventional attack and by reconnaissance. Their general ground targets will be the enemy's capability to fly or launch his nuclear weapons, and his ability to move his troops into or in the tactical battle area. This action will be of great indirect assistance to the fighting of the land battle. Additionally, so long as Tactical Air Force aircraft retain a capability to strike pin point or small moving ground targets they can, in emergency by the direction of the theatre commander, be diverted to tasks more directly in support of the corps battle.

7. When considering what effects the use of nuclear weapons will have on the various strata in the battle area, it becomes apparent that the higher the level of command up to corps, the greater is the change from previous thought and planning. There will inevitably be some changes in the life and work of the fighting soldier in contact with or in the neighbourhood of the enemy, but generally these will be of degree only. At higher level, however, the changes in tactical policy will be much

greater; not only because of the obvious need to adopt a greater dispersion of formations and units to minimise the effect of hostile nuclear missiles, and thereby to assume responsibility for much larger areas, but because in the future commanders will tend to plan their battles differently.

8. Defensive and offensive operations are considered at corps level since it is probable that the corps commander will be the most senior commander who will fight the tactical battle and who, in addition, will initially approve the nuclear fire plan.

9. Experience in nuclear matters is still very limited and restricted; consequently doctrine based on such brief experience may not always prove sound or lasting. Not only are techniques in the use of nuclear weapons untried but the weapons themselves are at present far from finalization and perfection. They are indeed in a state of early growth —and of constant and continual change in character. Each stage in their development tends to modify previous thought as to their tactical application.

10. In due course, evolution in weapons and equipment will almost certainly dictate new lines of thought on which to base tactical concepts. Therefore, further sections will be prepared from time to time to cover current thought and policy. They should be read in conjunction with such factual documents as may be issued so that training may be properly related to the capabilities and limitations of nuclear weapons.

11. No-one can say how many missiles will be available to a commander if and when war starts. For study purposes a tactical sufficiency should be assumed; that is to say, the minimum number which will enable a commander to plan his battle based on the use of nuclear weapons.

12. It can be assumed that during the next few years nuclear missiles will become increasingly plentiful and in doing so they will alter completely the previous tactical concepts. Although the use of the megaton weapon is a possibility, it is not considered in this pamphlet because it is unlikely to be used in the tactical battle by either side, although it may well be used in the interdiction programme.

13. It is not intended in this pamphlet to deal in detail with the problems and actions of individual arms in each phase of war, though the roles of some of them will be mentioned in subsequent paragraphs. Nor has the use of chemical or bacteriological warfare by our enemies or allies been considered.

14. It is not possible or desirable to include all the data about nuclear weapons, their systems and effects in a pamphlet of this nature, but it is important that officers should study the official pamphlets which are available or about to be issued. These include:—

(*a*) *Offensive aspects*

In the past for security reasons training, except in British Army of the Rhine, has been based on a hypothetical British family of nuclear weapons and yields. The decision has recently been made to base training on United States weapons and the North Atlantic Treaty Organization procedures and training family of missile yields. A War Office pamphlet is

due to be issued in the summer of 1958 to implement this decision. Pending its issue the following publications are still of value.

(i) " Interim Instruction 2A on the Tactical Employment of Nuclear Weapons (Primarily for Use by Artillery Officers) " (War Office Code No. 9476).

This pamphlet issued on an all arms distribution (except in the British Army of the Rhine) is based on the British training family of weapons.

(ii) United States Department of the Army Pamphlet 39-1 " Atomic Weapons Employment. "

This pamphlet is issued throughout the British Army of the Rhine, and instruction at the Staff College and Royal Military College of Science is based on it. It is however obsolescent.

(*b*) *Defensive aspects*

(i) " Precautions against Atomic Attack—1952 ". (War Office Code No. 8769). A junior ranks' guide to the effects of nuclear weapons issued throughout the British Army.

A revised edition is being issued during 1958.

(ii) " The Nuclear Handbook for Staff Officers and Instructors " 1957 (War Office Code No. 9405).

Issued throughout the British Army. Designed for the use of staff officers and unit instructors.

SECTION 2.—NUCLEAR BACKGROUND

1. A sound knowledge and understanding of basic facts concerning the employment and effects of nuclear weapons is essential to all commanders and staff officers who may be required to plan a nuclear battle.

2. Where expert examination of a particular problem or a target analysis is required, this will be carried out by trained artillery staff officers at all levels. As well as a general knowledge of the capabilities and employment of the nuclear weapons, those involved in planning must appreciate the statistical effects of certain types of nuclear explosions under various conditions of ground and weather and against different types of targets. In addition, the relationship between the yield, the target, the range, the circular error of probability, the method of delivery with its response time and its reliability factor must be well understood, so that sound appreciations can be made.

3. From such knowledge three facts will emerge at once:—

(*a*) The tremendous power which is now inherent in the weapons in current use within the corps, a power of a different order of magnitude from anything previously conceived.

(*b*) The vulnerability of troops in the open compared to those who are fully protected—the casualties may be multiplied at least nine times for troops in the open.

(*c*) The power of the nuclear weapon enables battle situations to alter radically and violent changes to occur in a very short space of time. These changes should make it possible to turn defence into attack and commanders must be prepared to take immediate advantage of such conditions.

4. The employment of nuclear weapons has increased the necessity for successful target acquisition. At present the methods used are limited in their capabilities. The development of drone equipment and other new devices could in due course provide much of the data required for selecting targets for nuclear strikes, particularly when used in conjunction with other means of obtaining information.

5. In selecting suitable targets for nuclear weapons, four factors must constantly be in the forefront of a commander's mind:—

(*a*) Target acquisition.

(*b*) Target analysis and response time—ie, the time taken from the acquisition of a target to the time of delivery of a missile on that target.

(*c*) The capability and reliability of the particular weapon or weapons and their systems.

(*d*) The time taken to warn all concerned.

6. Nuclear artillery will become the predominant arm on the battlefield with armour and infantry in support of it. In the past, commanders at corps and divisional level normally decided on their objective, assigned their forces in suitable degree to achieve their purpose and finally allotted the necessary fire and other support. In the future, planning will tend to be centred around the positioning of the nuclear missiles to achieve the aim. Nevertheless whilst the development of the ensuing tactical operations will be very largely linked to the nuclear plan, commanders must still give full consideration to the proper balance and capabilities of all arms. Nor must they ignore the limitations of the present family of nuclear weapons in response time, reliability and accuracy.

7. The introduction of nuclear weapons has affected the tactical significance of ground. Although its importance still lies chiefly in its value for observation and its effect on movement, the concept of occupying tactical ground or ground vital to the defence is no longer valid. The power of the nuclear weapon can destroy or neutralize any position however strong. In future it must be the aim to retain control of an area by offensive mobile operations.

8. Practical protection against a nuclear attack is threefold:—

(*a*) A dispersed lay-out.

(*b*) The digging in of all troops, and equipment where possible, together with thermal protection.

(*c*) Concealment, camouflage and deception.

9. Although the present concept envisages the use of mobile groups, it must not be thought that the importance of digging has diminished. It has, in fact, greatly increased owing to the power of the nuclear weapon against men in the open. But the digging which will take place is primarily for nuclear protection and not for the purpose of holding ground.

10. The importance of camouflage and deception is increased in the nuclear battle. If an enemy can be deceived into launching a nuclear attack on to a false position and then follows it up, the defence is well placed to take advantage of it. The deception policy must, however, be laid down by corps and form part of a concerted plan.

11. The importance of concealment and movement discipline in the lying-up areas cannot be over-emphasized, and this is particularly important in the case of nuclear weapons. In this connection the nature of areas offering suitable concealment has changed. Previously all units have tended to make use of woods or buildings. It should be remembered that these could prove to be unsuitable under nuclear bombardment. The former could inhibit vehicle movement due to fallen trees and, after hot dry periods, might be set on fire, whilst the latter could cause serious casualties from the secondary effects of the explosions. Avoidance of obvious locations, helpful ground configuration and cover which will not trap units in flames will provide the best aid to concealment.

12. Finally there is the all-important question of morale which it is impossible to assess except under conditions of actual battle. This is dealt with more fully in Section 8.

SECTION 3.—ENEMY TACTICS

1. Before it is possible to make a sound tactical plan it is necessary to have a broad knowledge of the methods which a possible enemy is likely to employ. Detailed examination of information about his organization, equipment and method of training may disclose his possible weaknesses which can then be exploited to advantage. Furthermore a study of his actions in previous wars, and of his national characteristics, may serve as some form of guide in planning. Succeeding paragraphs of this section are intended to give some information as to the current trends in enemy organization, equipment and tactics.

Organization and equipment

2. Since World War II there has been a steady trend towards complete mechanization, and emphasis on the tank at the expense of the infantry. Of the four types of division eg, rifle, mechanized, tank and airborne, the rifle division is now unlikely to be used offensively except in remote theatres or only as Line of Communication troops. Mechanized and tank divisions are both armoured divisions as we understand the term, the main difference being the proportion of tanks and infantry.

3. In addition to the enemy nuclear potential being at least equal to our own, it must be assumed that he will have a very great preponderance of conventional armaments, both armoured fighting vehicles and artillery, as well as great numerical superiority. He is also likely to have a large air force for reconnaissance and close support of his ground forces. The primary targets of his ground attack aircraft will be our missile sites and units, our means of surface movement, headquarters and establishments of all types, troop and vehicle concentrations and gun areas. Provided that his facilities for operating conventional aircraft survive our nuclear air strikes, the greater number of aircraft available to him will allow of a much larger scale of conventional support using rockets and flame weapons in support of ground troops.

4. Training in the enemy army places great emphasis on offensive operations. His doctrine stresses five main themes:—

(*a*) Offensive action and maintenance of momentum.

(*b*) Surprise in speed, weight of attack and deception as to point of attack.

(*c*) Mobility.

(*d*) The supremacy of the tank and its use in mass built up in great depth.

(*e*) Protection from nuclear attack by closing up to and intermingling with the enemy.

5. In general he envisages the assault formations being held dispersed in areas well back (up to 60 miles) until the last moment, and then moved forward under cover of darkness to arrive in the assault area in time to exploit a bombardment programme. Information about the move forward to the assault area is of primary importance if this type of attack is to be forestalled by our nuclear weapons. Although individual attacks may be well separated, there will probably not be great dispersion within formations and units, the frontages being much the same whether nuclear weapons are used or not.

6. The enemy expects to safeguard himself from nuclear retaliation by attack on our nuclear potential using surface weapons, air strikes and airborne troops. Concealment and protection of our nuclear launching sites, and means of deceiving the enemy as to their whereabouts is therefore essential. If our nuclear weapons can remain operative, the mass tactics of the enemy should provide excellent targets.

7. Subsequently the enemy hopes, by maintaining the momentum of his attack, to disrupt communications and overrun our nuclear sites. Our troops must therefore be sited and operate with the aim of slowing up the enemy advance and containing him long enough for a nuclear counter attack to be launched, supported by reserves.

8. His tactics for the passage of obstacles include initial crossings on a broad front to locate and define the defence, light opposition being brushed aside. Great emphasis is placed on the use of amphibious tanks and armoured personnel carriers so that the momentum is not lost while bridges or rafts are constructed. It is therefore important that the defence should possess the necessary mobility and striking power to engage and destroy the comparatively light enemy spearheads before their heavier weapons can reach them. At the same time it is equally important for the defence to strike at the enemy's obstacle crossing equipment and at the troops required to operate it whilst they are exposed.

Defensive operations

9. Enemy defence tactics are at present based on a series of zones organized in depth, both frontages and depths having increased in recent years. Trench systems with overhead cover and deep dugouts are given great emphasis, though it is possible that a new more mobile method of defence on a river line is being developed. Although nuclear weapons may be expected to support the defence, there is no sign of a corresponding reduction in the present scale of conventional artillery support.

Possible enemy weakness

10. In general the enemy appears to have adapted his organization to a war with or without nuclear weapons. He has greatly increased his scale of mechanization and the resultant increased dependence of his administrative echelons on a road Line of Communication should present profitable targets for our nuclear weapons. His continued preference for massed attacks should also provide good targets.

SECTION 4.—DEFENSIVE OPERATIONS

General

1. The importance of an obstacle as an aid to defensive operations has always been considerable although it has frequently proved a broken reed when the defence has relied on it for total protection. An obstacle may be natural or artificial, or it may be a combination of the two. But whatever its character, its importance in the nuclear battle is probably greater than it has ever been before.

2. A major obstacle will inevitably inhibit the movement of an enemy in a certain area for a period of time, however short. It will certainly canalize his movement and may cause him to concertina. He will be forced to expose a valuable proportion of his troops during his passage of it. In addition, at some period or other in the battle it must divide his force. All these factors work strongly in favour of the devastating effects of nuclear missiles.

3. The enemy may be successful in places in getting his light tanks across a water obstacle since they are amphibious, and these may be supported by infantry in amphibious armoured personnel carriers or carried in helicopters. Although the number of amphibious tanks and infantry in armoured personnel carriers may be considerable, such forces will be at a disadvantage in operating against our armour which at that stage of the battle will have the advantage of superior armament. To compete on equal terms, the enemy must succeed in getting across his heavier, non-amphibious tanks. For the main armour to cross, rafts, ferries and some form of bridge must be erected by engineers working largely unprotected against nuclear explosion and subject to its widest effects. The enemy's problems here will be aggravated if the most likely points of egress can be denied by mining or possibly by the creation of swamp areas.

4. Where the obstacle is not a water obstacle, but is formed either by peculiar terrain, by demolitions, by extensive minefields, or by a combination of such factors, the opportunity may be artificially created for the defence to employ their nuclear weapons in a more strictly limited area. The strength of any obstacle should be increased by the use of minefields to canalize or disrupt the enemy movement. In sum, the corps defensive lay-out must be based on a major obstacle. It would be an advantage if this was supported in rear by one or more minor obstacles to assist in containing and sealing off enemy penetrations.

5. The need for dispersion and the necessity to depopulate the battle zone has greatly increased the frontage and depth of the corps area. Future deployment will show great differences from all previous thought. There will be no question of en cadre defence, nor of permanent static positions designed to withstand a prolonged major assault. Mutually supporting formations with interlocking fire plans will no longer be possible.

6. The power of nuclear weapons to annihilate any defensive position once it is discovered is such that protracted defence in a fully dug prepared position will not be possible in the future. Furthermore, such positions in a widely dispersed lay-out, even if they were not overwhelmed by nuclear fire, could easily be by-passed and would therefore have no influence on the battle.

7. The theme of the defensive battle will therefore run on these lines:—

(*a*) Based on a major natural or artificial obstacle, the defence will aim so to cripple the attacking forces on the obstacle line that they will be unable to develop their offensive. This aim will succeed if full advantage is taken of the power of nuclear missiles against unprotected troops, and if heavy destruction of the enemy's obstacle crossing potential, both in equipment and in technical troops, is achieved.

(*b*) However, should the enemy succeed in crossing in force and commence deeper penetrations, forward units will retain contact, delay him where possible, and attempt to define his flanks. Meanwhile, fresh infantry armour battle groups positioned in depth will seek to contain his forces within a known area.

(*c*) Then at the earliest opportunity a corps counter attack will be launched. This will consist of a nuclear strike exploited by armour from the corps reserve with the aim of regaining observation along the obstacle line.

(*d*) Throughout the operations the conduct of the battle will be based on mobile groups located in dispersed and concealed areas, acting offensively at the correct moments rather than relying on defence based on permanent occupied defended localities.

8. For this purpose infantry and armour will be continually grouped together, that is to say the infantry battalion—armoured squadron and in some cases the infantry company—armoured troop, will form part of permanent teams available at certain degrees of notice to carry out their offensive tasks.

9. It will be clear that in a dispersed lay-out some penetration may take place during the hours of darkness. This must be located and pinpointed by active patrolling. These patrols should be linked to conventional on call artillery fire and the enemy must be eradicated within a matter of hours so as to prevent a build-up taking place in any one area sufficient to threaten the defence.

The Battle Phases

Phase I. The delaying action on the enemy side of the obstacle.

10. The extent to which a mobile covering force can be employed beyond the obstacle, and its composition, will depend on such factors

as the ground, the time in hand for the preparation of the main position, and the troops available. The purpose of this force will be to impose delay and where possible to define targets. It will contain engineers whose task will be to deny mobility to the enemy to the greatest possible extent within the time available. It will withdraw in the face of the enemy advance causing him successive delays and encouraging him, where possible, to concertina and thus to provide suitable targets for nuclear missiles. The composition of this force will vary with circumstances and with particular regard to the ground and to the delay to be imposed.

Phase II. On the obstacle.

11. The aim will be to inflict such crippling casualties on the enemy crossing the obstacle that he can no longer properly develop his plan on that part of the front.

12. To achieve the aim it will be necessary to prevent the enemy forces building up in sufficient strength to break out of any lodgement area and to remove such areas speedily in the early stages of their build-up. This will entail the positioning of a number of infantry armour battle groups at constant readiness for offensive action, operating either with gun-fired low yield nuclear shells or conventional fire support. These groups will be controlled by brigade group headquarters allotted to the sector and positioned in depth in a zone extending up to three to four miles from the obstacle.

13. To provide information on which to base such action, constant surveillance of the whole obstacle line must be achieved. By day this can be carried out by relatively few troops well placed, consisting chiefly of armoured cars, reconnaissance troops from armoured regiments, artillery and infantry observation posts and surveillance radars. By night or in conditions of poor visibility it will be necessary greatly to increase the infantry required for this purpose. Such infantry will operate from forward bases and be prepared to eliminate minor crossings as they occur. If a situation develops beyond their control, infantry armoured battle groups as mentioned above will be assigned to the task as rapidly as possible.

Phase III. The stabilizing or containing phase.

14. Should the enemy succeed in establishing a force sufficiently strong to overcome the obstacle defence zone and commence a powerful penetrating movement, then fresh forces positioned in depth five to ten miles from the obstacle will contain his movement. This they will do by establishing an anti-tank screen astride the enemy lines of advance on ground previously reconnoitred and making full use of existing obstacles.

15. While these containing forces are deploying from their concealed positions, it will be the task of the infantry armour groups from the obstacle defence zone, assisted by armoured cars, to retain contact with the enemy, delay his advances and above all contain the flanks of the salient.

16. The timing and movement of the containing forces is very delicate. If they move too late they will fail to contain the enemy, and if they move too soon and are discovered, they will be subjected to nuclear bombardment whilst in a highly vulnerable state. Improper or ill conceived movement on the nuclear battlefield is hazardous in the extreme.

17. The aim should be to move, probably by night when the enemy are reasonably near and above ground, to close with him and remain in close contact, thus denying him further penetration and containing him until such time as the corps counter attack can be launched.

18. The positioning of the brigade groups in the containing belt is not similar to the depth brigades of a division in the previous concepts of defence. Like the forward brigade groups in the obstacle defence zone they will be widely dispersed in infantry armour groups, and must be concealed and dug in for their own protection.

19. But although ground has lost much of its significance owing to the ease with which it can be neutralized by nuclear weapons or by-passed, these groups must take every advantage of positions which will afford observation, and which will assist them in the task of sealing off enemy penetration for a limited period.

20. Brigade groups allotted to this zone, in addition to having the containing battle as their primary role, also ensure that, in the event of an enemy nuclear saturation strike on the obstacle line, intact formations still exist to continue the battle and are available to operate against him as he follows up his nuclear bombardment.

Phase IV. The corps counter stroke

21. As soon as the enemy effort is sufficiently stabilized, the corps commander will launch his nuclear counter stroke, supported by his corps reserve which will probably consist of one or more armoured brigade groups. Although this attack will be based on the broad directive of the corps commander and supported by corps units, the detailed planning and the execution might devolve upon a divisional headquarters which has been kept out of battle for this purpose.

22. The attack will be based on a nuclear strike which will be followed by an armoured force supported by infantry in armoured personnel carriers, by engineers for route clearing and by monitoring teams. The axis of the attack may well come from a flank but this must depend on a contemporary appreciation. Their task will be to ensure that no enemy remain established on the near side of the obstacle.

23. A medium or high yield nuclear attack cannot be made against enemy troops in close contact with our covering forces and plans must be made to deal with enemy in the immediate neighbourhood of, or intermingled with, the containing forces as a subsidiary operation to the main counter stroke. Paragraphs 9 and 10 of Section 5 deal with this aspect.

24. The balance of forces allotted to the various phases must depend on the following considerations:—

(*a*) The nature of the obstacle and the terrain in its neighbourhood.
(*b*) The amount and type of forces, and nuclear support available to the commander.

25. Given a good obstacle, a sufficiency of accurate nuclear weapons and the necessary surveillance of the obstacle a commander may well decide that he can win the battle on the obstacle and therefore deploy the weight of his forces in that zone. Alternatively, he may decide that enemy penetration is virtually inevitable and therefore retain the bulk of his forces in depth for the containing battle.

26. The armoured brigade groups will normally be assigned to corps reserve, but a proportion may be located for use in the containing phase, or may even be positioned so that by their dispersed locations they can provide some security to the nuclear weapon sites.

Furthermore, it must be remembered that there may be a constant threat of airborne assault. Commanders at all levels must organize means of dealing with this contingency and at formation level the desirability of a proportional allocation of available armoured cars is stressed.

Fire power

27. The fire power for the battle will consist of nuclear fire and conventional fire, these methods being complementary.

28. In Phase I the fire support will probably consist of disruptive fire tasks, mainly carried out by the CORPORAL regiment.

As the mobile forces withdraw and the ranges get shorter some additional support may come from the shorter range nuclear weapons, ie, the HONEST JOHN and the 280-mm, fired from forward positions. Closer in still the targets may come within the range of conventional medium artillery deployed well forward. The HONEST JOHN is more mobile than the 280-mm and, with its bigger yield, is a better area weapon. In Phase I, therefore, it is the more likely to be used in support of the mobile forces beyond the obstacle.

29. All these weapons can only be used effectively if information is available of enemy movement. In addition to armoured car patrols the use of special air service and agents will be most useful.

30. In Phases II and III all forms of fire power will be available and its application will be dictated by considerations of range and suitability. Both on the obstacle and in the dog-fight of the containing phase of the battle, conventional weapons will be used for the close support of the infantry and armour. On the obstacle itself variable Time fuzes should be particularly effective.

31. The nuclear artillery will primarily be used for counter bombardment and counter preparation in Phases II and III. In Phase III nuclear fire may also be needed to reduce the enemy pressure on the infantry and armour if the containment of the enemy looks like getting out of hand.

32. In Phase IV the fire effort will consist mainly of an all out nuclear offensive. Once the area has been defined and the main target centres decided, the problem will be for the technical staffs to estimate the quantity in yields required to achieve the aims.

33. In handling the shorter range nuclear weapons forethought will be needed in positioning them so that the greatest weight of fire can be brought to bear on the enemy penetration.

34. The corps defensive battle will be fought in conjunction with an army group interdiction programme. Such a programme, it is anticipated, will destroy the enemy rear formations or, at any rate, prevent them moving forward to the battle area and exploiting any local successes which may have been achieved. By this means it is hoped that,

although the corps may inevitably have a battle to fight in which it will be outnumbered, enemy reserves will be restricted or reinforcements will not be forthcoming. If the enemy preponderance of strength can be materially reduced astride the obstacle, then the defence will be well situated to ensure a successful outcome to the battle.

SECTION 5.—COUNTER-OFFENSIVE OPERATIONS

1. The power of the nuclear weapon enables battle situations to alter very rapidly and it may be possible to assume the offensive at very short notice. To take advantage of this commanders must retain larger reserves than hitherto both in nuclear fire power and in formations.

Fire power

2. Offensive action will be planned around the use of the nuclear weapon. Having decided what he wants to achieve, the commander will organize his nuclear fire plan to achieve his aim and will support this by means of infantry armour battle groups.

3. Prior to the offensive every effort will be made to dislocate the enemy's tactical nuclear potential. This requires first-class reconnaissance, target acquisition and subsequently an integrated fire plan by all means at the disposal of the commander. Means of obtaining the necessary information will consist of air reconnaissance and data produced by drones and other new methods as they become available, in addition to Special Air Services normal patrol activity, and shelling reports (Shelreps). Information concerning targets consisting of the headquarters which control nuclear equipment will prove particularly important. Electronic counter measures should if possible be initiated on his control systems.

4. In order to ensure that the speed and momentum of successful thrusts are maintained, it will eventually be preferable for forward commanders to order and control the firing of nuclear missiles. This requirement presents difficulties while the problem of the extent and degree of the flash effects of a nuclear explosion remains indeterminate.

Conduct of operations

5. Offensive operations may have alternative aims depending on circumstances. They may either take the form of a large scale raid or mopping up operation with the purpose of destroying the enemy before withdrawing, or they may be launched to gain control of territory previously dominated by the enemy, possibly with a view to further operations. In the latter case it will be desirable to include a satisfactory obstacle within the limits of the advance if there is any risk of an enemy counter stroke.

6. These operations will not resemble previous attacks where large forces were assembled, but will appear more in the light of a reconnaissance in force on a broad front by a large number of mixed groups of armour and infantry, supported by self propelled artillery and with nuclear strikes available to deal with an enemy position when located. It will no longer be desirable or even possible to concentrate forward troops in mass on a narrow front for a limited breakthrough.

7. The attack following nuclear bombardment will have three aims:—

(*a*) Overcoming the enemy's control headquarters and nuclear weapon sites.

(*b*) Penetration to the limits of supportable depth together with the mopping up of peripheral survivors.

(*c*) Reorganization behind a fresh obstacle or, alternatively, withdrawal to the original area.

8. The axis of the attack should not necessarily be directed into known gaps. These are likely to be pre-determined areas for the enemy nuclear counter attacks. Commanders will achieve their objectives by the skilful routing of reserve groups following up and taking advantage of successful penetrations.

9. In areas where both forces are in close contact it may not be possible to subject the foremost enemy troops to a medium or high yield nuclear attack and therefore in spite of nuclear strikes in rear a crust of enemy resistance may remain. When this is so, it may present the most delicate part of the attack. No time can be lost on this phase if full advantage of the main nuclear strike is to be taken. The relationship of the timing between the battle of the crust and the firing of the main nuclear offensive requires very careful study.

10. Where an outflanking movement is not possible and where it is essential to break the enemy's forward positions, this attack must be planned in detail and sufficient reserves allotted to ensure success since the nuclear offensive in depth will be closely linked to it. The breakthrough force must be positioned in rear, dispersed and ready to be launched. No reliance must be placed on the possibility of the crust collapsing because of morale effect of nuclear strikes behind the forward zone. If this should occur, it should be regarded as a bonus and immediate advantage taken of it. It may, on occasion, be necessary to withdraw the forward troops to enable low yield nuclear missiles to be fired on to the enemy forward localities. This will depend on the judgement of the commander as to whether or not he can break the crust with conventional forces. Where withdrawal is inevitable nuclear security will be needed by the troops in the new temporary locations to which they have withdrawn.

11. In order to avoid presenting a nuclear target to the enemy the attack should be conducted by comparatively small armour infantry battle groups, with a substantial proportion of the infantry mounted in armoured personnel carriers. The battle should be thought of in terms of areas and the ultimate objective, rather than in the restricted terms of lines, bounds, intermediate objectives, junction points and strict tempo.

12. All commanders must be trained to work to an overall directive. They must know the intention of their superiors at least two, and possibly three, up. Initiative and independent action must be the predominant thoughts in each commander's mind. His methods must be flexible and must not be irrevocably fixed to a rigid plan.

13. In the breakthrough action the leading troops consisting mostly of armoured units will be required to penetrate deeply and quickly to make good the advantage gained by the use of nuclear missiles. The movement should consist of forward thrusts on as broad a front as possible, fanning out to the periphery of the area subjected to the nuclear strike.

14. It must be remembered that even when nuclear missiles are airburst, there is a degree of neutron induced gamma activity around ground zero. Provided that the area is traversed in vehicles at reasonable speed and the actual epicentres avoided, no unacceptable danger should ensue. On foot, however, there is a considerable risk for several hours and therefore the necessary, properly equipped, monitoring teams must be positioned in the forefront of any advancing force, however small.

15. Reconnaissance troops will be widely and boldly deployed; their role is as important as ever; the principles governing their employment remain the same.

16. The need for resourceful action by strong detachments of engineers will be essential in maintaining the momentum of the advance. They must be especially well trained in rapid methods of route clearance and in overcoming obstacles.

17. In order to confuse the enemy as to the strength and direction of the attack and achieve surprise, it may be that an attack should be timed so that the nuclear strikes take place last light and are followed during the hours of darkness by the main attack. Thus the major part of offensive actions would take place by night and thereby take advantage of the reduced enemy air and target acquisition potential.

18. When the crossing of a defended obstacle is involved, this should be attempted in the first place by small battle groups at a number of points on a wide front, following a nuclear bombardment. Immediate advantage of the ensuing effects must be taken and pauses to form conventional bridgeheads should be avoided. Once suitable crossing places have been reconnoitred nuclear weapons should be employed to pave the way for deep penetrations at selected points. The commander will use his reserves to maintain the momentum so as to unbalance the enemy's defence plans, and in particular to nullify his efforts to launch a nuclear counter offensive. The programming of the follow-up forces and the timing and method of crossing the obstacle will be the most difficult part of the operation, but the outcome of the battle will largely depend on the successful accomplishment of this phase. It is important to prevent the enemy from containing the attacking forces and great efforts must therefore be made to get tanks and infantry in armoured personnel carriers across the obstacle at the earliest possible stage. A force so constituted will possess mobility and some degree of protection against nuclear counter attack should the enemy be successful in firing his missiles.

19. It is essential that the leading troops remain dispersed and that when the time comes for reorganization or refuelling they should be well concealed and dug in.

20. On this battlefield the importance of the more junior commanders at company and squadron level will be increased. It is on their determination, skill, initiative and ability to maintain the offensive spirit of their men, that the successful outcome of the nuclear offensive action will depend.

SECTION 6.—COMMAND AND CONTROL

1. It will be the corps commander who will control the tactical battle and who will plan initially the nuclear effort.

2. In addition to nuclear artillery the corps commander will have under command a number of brigade groups, armoured, infantry, and on occasions parachute; and divisional headquarters. Having allotted areas of responsibility and tasks to the brigade groups, he will superimpose divisional headquarters to control appropriate groupings. Such grouping may well vary from time to time during operations.

3. Staff duties must be simple and standardized to facilitate the rapid and smooth incorporation of different brigade groups of varying types, armoured, infantry and parachute, as required. Staff work must in due course be aided and speeded up by the use of more machines and better equipment, both office equipment, radio equipment and machinery to collect and disseminate information.

4. The range and power of modern weapons will impose a need for some division of headquarters in order that a nucleus of an alternative headquarters is always in being. The additional strain thus imposed is considerable but must be accepted.

5. The system of command will tend towards directives rather than orders and order groups. Command will inevitably be much looser and a greater responsibility will fall on the more junior leaders to further their commander's aim. It is unlikely that any detailed planning can be carried out in advance beyond the first phase of an operation. Full and detailed operation orders will not be desirable since they will tend to become inaccurate or superfluous too soon.

6. Commanders will inevitably have to retain a most flexible outlook since, as previously stated, nuclear weapons will produce frequent changes in the situation leading to far reaching results in a short space of time. They will tend to operate more from their headquarters where information analysis can be readily available from a variety of sources. When commanders feel that their presence is important at a particular point, they will probably move there by helicopter for a limited visit.

7. It will be harder for commanders at higher level to exert their personalities or to maintain such direct control as hitherto. They may be unavoidably out of touch for certain periods. Liaison officers will be of great value in keeping touch with subordinate commanders and acquiring information over wide battle areas. They also will move by helicopter.

8. Modern war tends to rely increasingly on electronic equipment at all levels on the battlefield. In addition, the employment of smaller groups operating over greatly increased distances emphasizes the overriding importance of all signal communications. If the standard of operating and maintaining the communication equipments is not of the highest, and if these techniques are not linked to proper security, then not only will the enemy be materially helped in his attempts to win the battle, but we shall be greatly restricted in our ability to use our nuclear weapons to full advantage.

9. The nuclear battlefield will inevitably produce a great strain on the communications system, and may indeed totally disrupt it for periods. Helicopters will at times form the sole link between headquarters. At lower levels junior commanders will need to be quite clear as to the overall aim and be prepared to operate within a broad framework without feeling that they are remote, until closer links can again be established.

10. The command of the nuclear artillery will entail the physical deployment and the administration of the nuclear fire units. The CORPORAL will normally be deployed and come under command of Army or Army Group, and will usually be put in direct support of a particular corps for a particular battle. The shorter range weapons, the 280-mm and HONEST JOHN, should be deployed so that along the whole corps front there is available the accurate nuclear fire of the 280-mm combined with the higher yield fire of the HONEST JOHN. Both these types of unit may be under command of corps, under command of a Commander Army Group Royal Artillery or placed under command of a Commander Royal Artillery of a division. The method used will depend on the number of units allotted to the corps and the general plan of battle laid down by the corps commander.

11. When two or more brigade groups are grouped together under a divisional headquarters the Commander Royal Artillery will co-ordinate the fire of the artillery belonging to those brigade groups so that when possible concentrations of more than one regiment can be fired.

12. Nevertheless in any offensive movement it will be the aim, as far as possible, to decentralize control of the weapons to lower formations, so as to take advantage of the rapid change in the battle situation which the weapons can bring about.

13. In defence the control of nuclear fire, that is the sub-allotment of nuclear warheads, and the firing of these weapons will normally remain at present in the hands of the corps commander. Control must be related to the area of effect and the warning which is necessary. The problem of overall control and warning vis-a-vis Air Forces is not finally resolved but at present clearance for nuclear strikes will be co-ordinated by the Joint Command and Operations Centre at Army or Army Group level.

14. The whole command and control system, subjected as it will be to nuclear attack and electronic counter measures, will be under severe stress. If chaos is to be avoided the battle plan must be simple, known to all, and capable of being implemented without continual re-direction. The clarity of intention of the commander and a wide knowledge of the principles on which he is working will be of vital importance.

SECTION 7.—TRAINING

1. It is not proposed to deal in detail in this pamphlet with methods of training for nuclear war. However, it is stressed that the type of training necessary within units does not differ materially from present day requirements. Certain aspects will be high-lighted, such as the techniques of digging rapidly and ensuring at least thermal protection. Joint training of armour and infantry battle groups will become more important and these battle groups must be able to carry out offensive action at short notice from widely dispersed lying-up areas. Skill in rapid and secure use of radio will be essential. Proficiency in the quick laying of minefields is likely to become of increased importance. Furthermore the significance of a high degree of skill in operating during the hours of darkness is emphasized.

2. But there are three main spheres in which continual thought and study are needed:—

(*a*) The study by commanders and staff of the nuclear scene, leading to the employment of nuclear weapons, their systems and their application to the battlefield; and of the methods of command best suited to fresh tactical concepts with a view to producing sound battle drills and staff procedures.

(*b*) The training of unit and sub unit leaders in independent action within an overall directive.

(*c*) Further education of technical staff and other officers in the capabilities of nuclear weapons together with an appreciation of some of the problems which lie behind their production.

3. It is at these levels that re-thinking is required rather than at the level of the individual soldier. The qualities required of him today, which are well known, and the methods taken by commanding officers to achieve those qualities, remain effective for the nuclear battle, provided that in addition care is taken to educate every man in the effects of nuclear weapons and to prepare him mentally in advance for the new sights and sounds of the future battlefield.

SECTION 8.—MORALE AND DISCIPLINE

1. The standard of leadership at all levels will need to be of the very highest order. Wider dispersion and isolation, lack of information and fear of the unknown will in the future greatly increase the tension on all ranks in battle; and these will be in addition to the awe inspiring effects of enemy nuclear explosions which will occur throughout the battle area.

2. Furthermore, the impact of high nuclear casualties occurring in a moment of time, rather than being built up over a period, must inevitably tend to affect morale.

3. A standard of discipline will be required which is based on understanding, sympathy and common sense, and in tune with modern conditions, but which may well have to be even stricter than it has been in the past.

4. The proper mental training for all men in what may lie before them in the nuclear battlefield will form part of the foundation for the maintenance of confidence at all levels. Psychology both contemporary and previously applied can play a big and helpful part. Indeed morale will depend on a frame of mind induced by a mixture of anger, hope, and confidence, and based upon strict discipline. The aim of previous education in the broad aspects of the nuclear battle will be to remove as much as possible of the element of surprise. In addition to mental training, practical knowledge of the means to minimise the effects of nuclear explosions, practice in automatic drills for self-protection, and training in first aid will all help to maintain a high level of confidence.

5. Morale has always been a prime factor in the conventional battle ; in the nuclear battle it will be the supreme factor.

SECTION 9.—CONCLUSION

1. Although the introduction of nuclear weapons is a step forward longer than that between bow and bullet, yet the principles of war remain unchanged though subject to modern interpretation. The conduct of battles, however, and the tactics now required have altered radically. It is important, therefore, that thought should not rest at the stage which this pamphlet has reached. Evolution of tactical doctrine related to weapon development and scientific potential must be continuous and constructive at all levels.

2. Finally, it cannot be stressed too strongly that it is still the standard of training both mental and physical of the individual man and the quality of his morale which will assist him, under courageous leadership, first to withstand the enemy's nuclear assault and finally to win the battle.

(Y870/58) 6000 6/58 W.O.P. 45943